August 16, 1948

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

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EDITORIAL INDEX, PAGE 53

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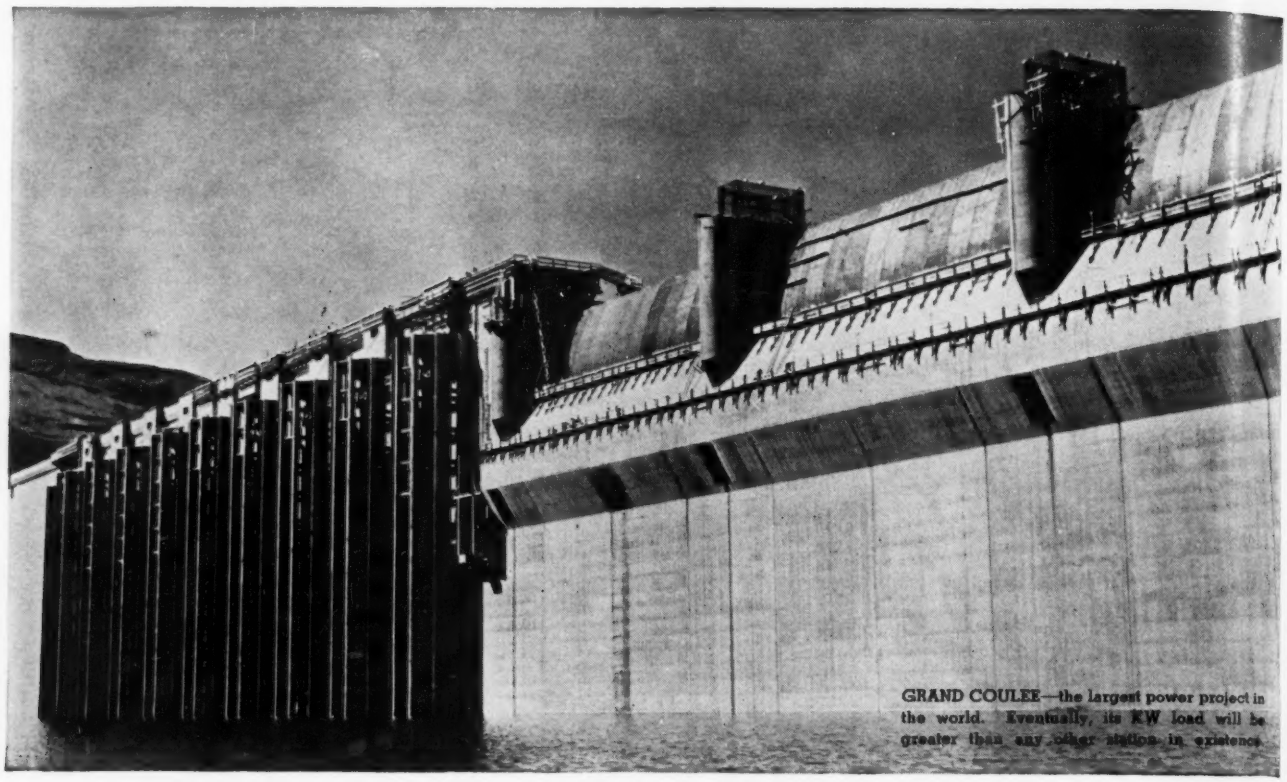

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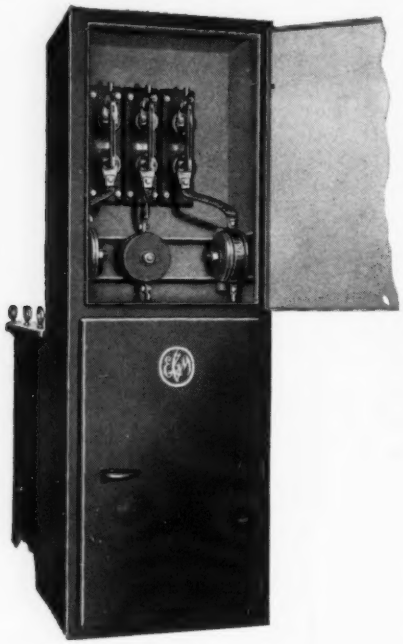

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Behind the Scenes...

Advanced Study for Industry

We were talking the other day to Guy Hubbard, our editor who knows all about machine tools. He was holding forth on the subject of advanced industrial education, of the type passed around freely and successfully at the recent "refresher course" for machine tool salesmen at Cornell University. We were jointly wondering why more of that sort of thing didn't appear on the industrial horizon, when the mail arrived, including a notice of the special course being sponsored by Hunter Spring Co., for all design engineers interested in spring specifications. You have probably already read about this deal in STEEL, because the editors think it's a pretty good thing. The success of the Westinghouse Machine Tool Forum is another indication of just how these "skull practice" sessions can build up. It's a movement well worth expanding, and we're happy to see the Hunter people doing this job.

Puzzle Corner

If by now you have looked up all the necessary references in the solution of that equation of two weeks ago, including the tierce and the chirps, we're very happy to tell you that the answer, which is the value of P, is now and will be at least until next January the number of living ex-presidents of the United States. This week we'll throw out a weighty problem for you to tussle with. A drug store operator with a little more than normal acumen figured out that he could compound prescriptions with only 5 weights, if the amounts called for in the prescriptions were all in ½-gram units and the total weight didn't run over a certain figure. What was that figure, and what were the values of the 5 weights, assuming that he could equal any weight called for from ½-gram to the maximum?

Miniscule Mental Task

Mr. William Brown of New York, who appreciates the puzzles in this column, sends in one of his own, which we will have to admit belongs in the superman class. We wouldn't dare run this as a part of our puzzle corner, but it is too good to pass up, so we print it herewith: "A certain attenuator element in a vacuum tube is made of tantalum wire bent in a wave shape. In order to prevent electron emission from reducing the exothermic bias of the tertiary suppressor grid, a flash coating of palladium is deposited on the wire. Palladium is, of course, quite expensive and it is applied by the vacuum deposition process to the depth of one molecule. There are several points in the manufacturing process at which the palladium could be applied. It might be deposited before, during, or after forming or at any point in the forming operation. Since forming tends to stretch the outside curve of the wire, the most economical point at which to apply the coating is at an intermediate point in the forming process. The question is this —for an .02 mm wire 6 cm long formed into a sinusoidal attenuator of amplitude 5 mm and wave length 1 cm, what should the shape of the wire be for maximum palladium economy at the time of coating?" Frankly, no answer came with the problem. We don't even know what most of the words mean. All we know is that the whole deal is smaller than the words used to describe it, and what those words are gonna do to the Flesch rating of this ~~colyume shouldn~~'t happen to an encyclopedia.

All Eyes to the East

According to Jay DeEulis, our eminent engineering editor, this week's book starts that long-heralded and widely-awaited series on tool steels. We warned you about it last week, remember? Well, you'll find the kick-off of the series a hundred or so pages to the east, and we hope you'll find it as promised—the best dog-gone job ever done on classifying tool steels, telling what they are and when to use them, how to handle them, and who makes them.

Add File File

We learned the other day that it was only the British accent which caused the trouble. Trouble, that is, in the file family. As you all know, there's an illegitimate member of that group. Originally that little file was as pure as its relatives. The bar sinister was applied when it migrated from England to America. It was originally manufactured by a Briton named Barsted, which, when pronounced with a British accent gives rise to illegitimacy in a hurry—which is exactly what happened.

Shrdlu

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STEEL

Vol. 123—No. 7 August 16, 1948

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Editorial Staff on Contents Page

August 16, 1948

The Choice Is Ours

President Truman's special session of Congress—called ostensibly to do something about inflation—has convened and adjourned and the results, as were to be expected, are unimpressive. However, the session did provide some enlightenment as to what this nation must do if it is to tackle the inflation problem effectively.

Debate in and out of Congress pointed quite clearly to the fact that few of the fundamental remedies for inflation are within the jurisdiction of the federal government. Also it was made evident that some of the measures which the government could initiate are not feasible at this time for political or other reasons. In this category are sharp reductions in government spending, postponement of federal public works and expanding social security projects, modification of agricultural and other subsidies and removal of government encouragement of repeated wage increases that bear no relationship to productivity. Government action along these lines would slow inflation, but such action will not be taken because it runs counter to the present administration's policy, which is and has been anti-deflationary consistently since 1933.

The inability or unwillingness of either the Executive or Legislative arms of government to do anything worth while about inflation means that remedies must come from elsewhere. The only likely sources are the law of supply and demand and the collective judgment of the people.

The time in which to choose between these two is growing short. On the one hand, we can sit tight and do nothing, in which case the law of supply and demand will provide its natural remedy, which probably would be an adjustment so drastic as to inflict widespread disaster. On the other hand, by intelligent action by the people, we can work in harmony with the law of supply and demand so that its medicine need not be as unpalatable.

Such intelligent action will involve determination by every group of people —owners, managers, employees, farmers—not to hold out for all the fleeting, momentary traffic will bear but to temper their individual demands with due consideration for what is beneficial to the whole economy. Unless we are willing to make concessions to the national welfare, we will pay a terrific price for our stupidity.

TIMING IS BIG FACTOR: Shaping up as important priority consumers of the nation's tight supplies of metals, equipment and man-hours of labor are the shipbuilding programs of the Navy and the U. S. Maritime Commission and the aircraft projects of the Air Force and the Navy.

The Navy has a 16-ship program calling for an estimated expenditure of $390,400,000. It consists of a flush deck 65,000-ton aircraft carrier, two antisubmarine cruisers, four destroyers, six high speed submarines and three antisubmarine submarines. Eleven of the 16 vessels, including the giant carrier, are to be built in private shipyards. The Maritime Commission's program calls upon shipping companies to build twenty 630-foot tankers with government financial aid. The Commission also is contemplating a passenger ship rehabilitation program, details of which may be given soon.

Meanwhile, the Air Force and the Navy have been given the green light on 4262 new aircraft, 3366 of which already have been ordered. That part of the program for which orders have been placed will involve almost $2 billion.

Obviously work of this magnitude cannot be

(OVER)

dumped into the nation's workshops without cutting down on the supplies of materials, equipment and manpower available to manufacturers who trade in the open markets. An important factor will be the timing of the requirements for these programs. They will be spread over several years and that fact affords the only encouragement to the ordinary customers who enjoy no priorities. —pp. 61, 62, 63

* * *

OUR SIAMESE TWINS? U. S. Department of Commerce estimates that during the week of July 4-10, 1948, the civilian labor force of the nation consisted of 63,842,000 persons. Of this number, 61,615,000 were gainfully employed and 2,227,000 were unemployed.

These figures establish new all-time high records for labor force and employment. They also reflect substantial gains during the past year. The labor force was 1,178,000 larger than in the week of July 6-12, 1947, and employment was 1,536,000 higher. Unemployment was down 357,000 from that of a year ago.

Apparently the nation now has achieved the condition of "full employment" it has been seeking. At the same time it has become involved seriously in an inflationary spiral which it has been hoping to avoid. Senator Ralph E. Flanders poses a thought-provoking, pertinent and timely question when he asks: "Can we have full employment without inflation?" —pp. 64, 68

* * *

SIMPLIFIES SELECTION: During the past several decades the evolution of American manufacturing processes—largely in response to the demands of mass production techniques—has advanced toolmakers and diemakers to key positions in industrial operations. Concurrently the materials used for tools and dies have increased in number and have improved in quality. Today there are literally thousands of different tool and die steels and carbides available from hundreds of manufacturers, agents, jobbers and importers.

In order to assist in the difficult problem of selecting the proper tool or die material for a specific use, the editors of this publication have prepared a tabulation showing for each steel its primary application, its trade name and type, its chemical analysis and suggested temperature ranges and quenching procedure for its treatment.

Although the information tabulated should simplify the user's search for the desired steel or carbide, final selection should not be made until he has consulted the producers offering the types of material which seem to conform most closely to his requirements. —p. 98

* * *

$30 STEEL PRICE HIKE: Even in these days of confusion in pricing, of inflation and of general price advances, the action of Henry J. Kaiser in hiking prices for his Fontana steel mill by an average of $30 per ton is unusual enough to startle the most stolid observers. The Kaiser explanation is that he wants the additional revenue to enable Fontana to repay its RFC loan at 100 cents on the dollar.

The effect on the Pacific Coast market will be interesting. Fontana customers who can get steel from other sources will do so, but the tonnage is limited. Those who must continue with Fontana in order to obtain steel will fare better at its new prices than the customers of the Century Steel Corp. and its 27 dummy corporations, whose bizarre trading activities have been revealed before the Macy Committee to Investigate Questionable Trade Practices. Under present conditions, Fontana plates will not go begging, even at $116 a ton. —pp. 66, 67

* * *

NEW DOCKS FOR TRUCKS: Partsmakers and fabricators who sell to the automobile industry are trying to figure out how mill pricing of steel will affect their business in the long run. The initial reaction is that the new pricing practice will provide a strong incentive for routing shipments by waterway and highway. Already some steel users in the Detroit area are discussing the possibility of organizing a trucking service to avoid the "double switch"—a double switching charge which they say the railroads are charging when the shipment moves over two rail lines.

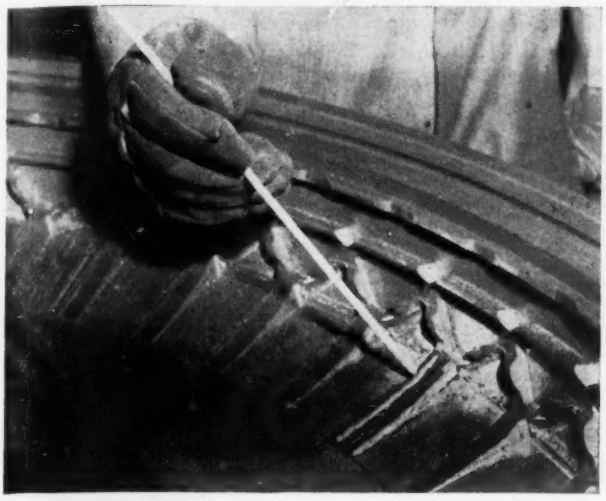
Any drastic shift to a greater use of motor trucking would require an extensive expansion and improvement of loading and unloading docks. Ford Motor Co. seems to be forehanded in this respect. New shipping and receiving docks now under construction at the Rouge plant will accommodate 411 trucks carrying 2145 tons of materials and parts daily. —pp. 75, 76

E. L. Shaner

EDITOR-IN-CHIEF

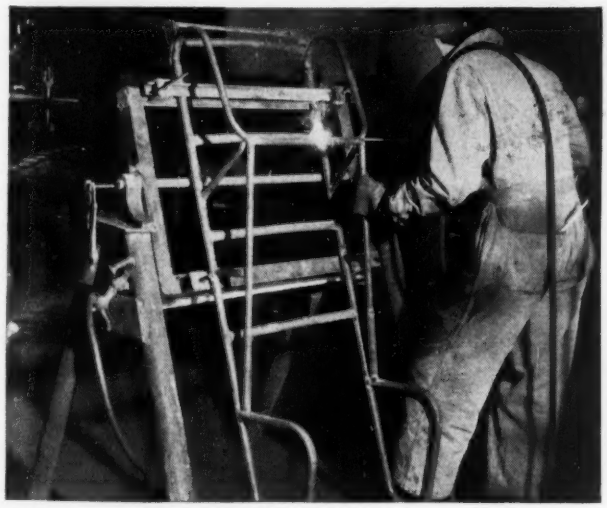
New Electrode Solves Many Welding Problems

Lincoln "Shield-Arc LH-70," for mild steel and hard-to-weld steels, operates in all positions, a.c. or d.c.



EASILY MACHINED. This manufacturer of tire molds, made of high-sulphur (free machining) steel, has simplified repair work with "Shield-Arc LH-70" because its deposits are easily machined and dense. Ribs in mold shown are being built up along edges due to machining error. Welded ribs will then be machined to proper size.

BANISHES POROSITY. In fabricating sprockets, this manufacturer welds together a disc of mild steel plate and a hub of round cold-rolled stock as shown. Formerly welds were porous; with "Shield-Arc LH-70," they are dense and smooth.



ELIMINATES HEAT-TREATMENT. In the welding of high-carbon, thin-walled tubing, this Company had to use costly heat-treating. This has been eliminated by welding with "Shield-Arc LH-70." Similar benefits are being obtained for high-tensile steels and welds to be porcelain enameled without annealing.

EASY . . . FAST. Many shops are using "Shield-Arc LH-70" for mild steel. On bevelled horizontal butt joints (above), it eliminates need for or materially reduces back-chipping and it can be used with easy straight-drag technique—no whipping required. On down-hand square butts (below), "LH-70" gives 15% to 20% faster welding because of ability to use higher current and get deeper penetration.

The above is published by LINCOLN ELECTRIC in the interests of progress. For further information on "Shield-Arc LH-70," write The Lincoln Electric Company, Dept. 79, Cleveland 1, Ohio.

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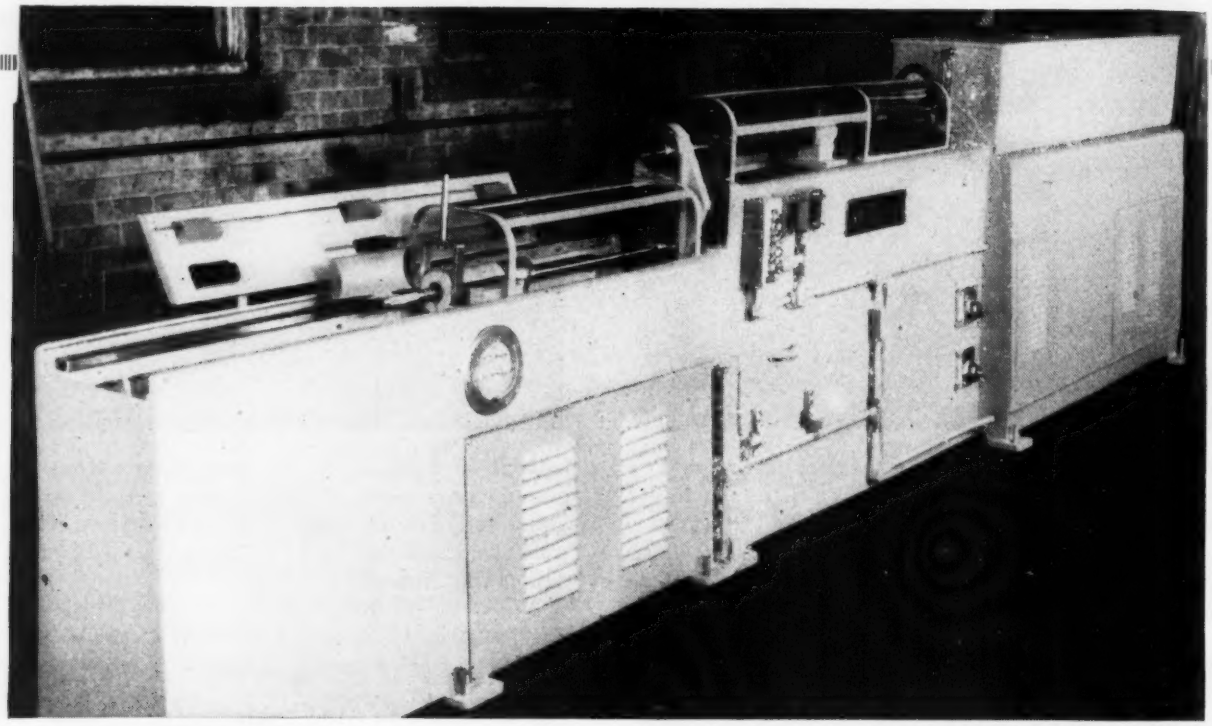

Horizontal Pull Broaching Machine
Photo courtesy of Lapointe Machine Tool Company

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News Summary

BLUEPRINT FOR DEFENSE— Nucleus of the staffs to direct industry (p. 61) in event of another war is being formed in Washington by National Security Resources Board. Filling key jobs on these staffs are many men from industry. With all of them getting procedures ready "just in case," the old State Department Building where they are headquartered is a beehive of activity. However, if it is necessary to go on a wartime footing, the NSRB might decentralize and scatter its agencies throughout the country.

MORE PLANES— Augmenting preparations to put industry on a war basis if necessary is authorization of the Air Force and Navy (p. 62) to purchase 4262 new planes, costing about $2 billion. Costs on these are up because they represent a relatively small quantity, because research and development are more costly in the present high-performance range, because airplanes are more complex and difficult to build and because labor rates and materials costs have risen sharply.

MORE SHIPS— Not only are defense measures being drawn up for the land and the air but also for the sea. The U. S. Navy plans 16 new vessels (p.63), is taking steps to keep private shipbuilding yards in readiness for any emergency, and is revamping and modernizing a number of warships. Meanwhile, the U. S. Maritime Commission is promoting plans to build 20 tankers and seriously discussing a passenger ship rehabilitation program. A not-far-off effect will be a cutting in on the already tight supply of manpower and steel.

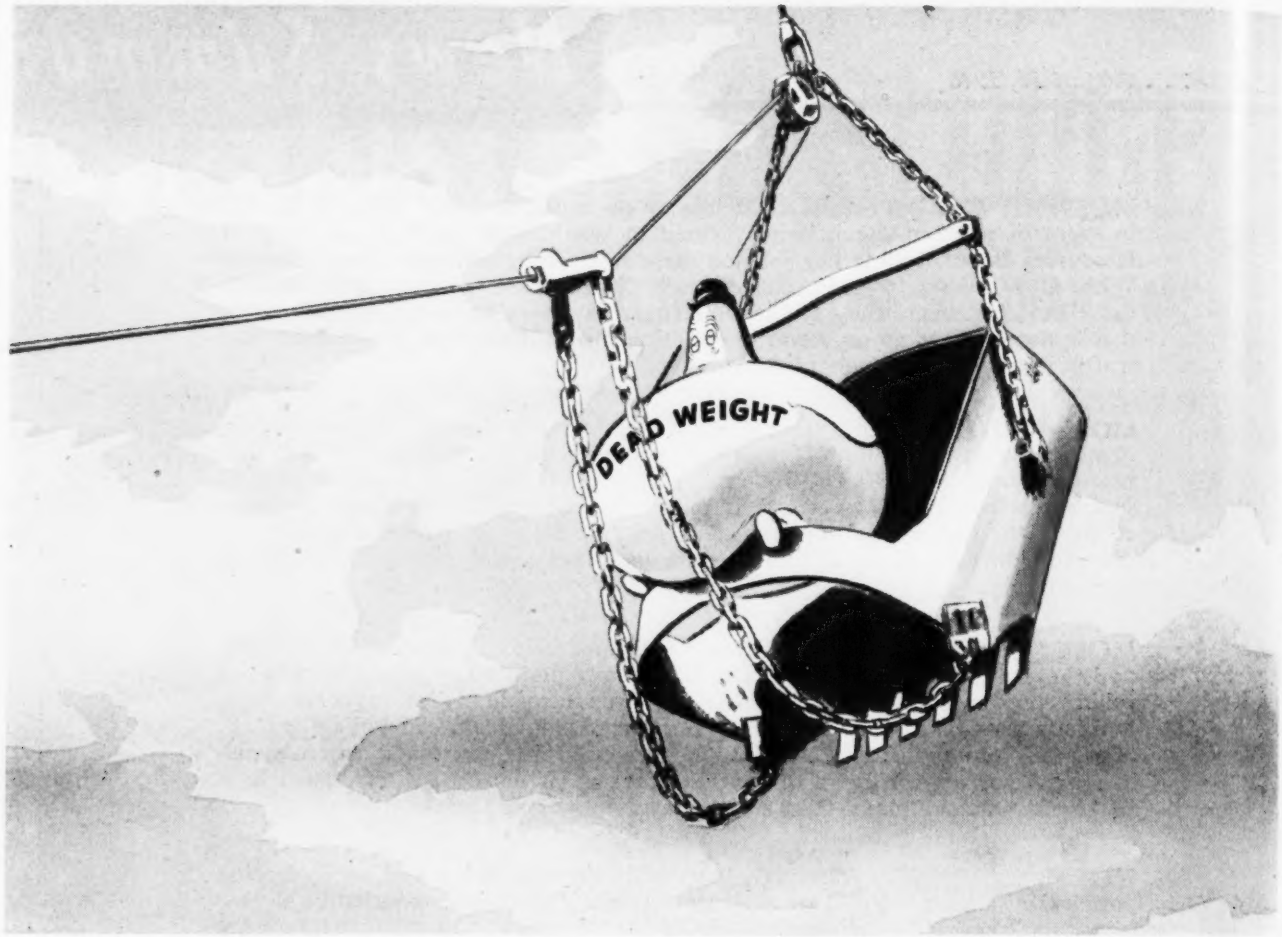
EVERYBODY BUSY— The high level of business activity and an increasing population have produced new all-time peaks (p.64) in nonagricultural employment, civilian labor force and civilian employment. In many respects the occupational labor force has changed since the end of the war, reflecting establishment of an unusually large number of new, small businesses and professional practices and the general upswing in trade.

PRICE SQUEEZE— West Coast steel consumers, deeply perturbed over Kaiser Co.'s announcement of a $30-a-ton boost in steel prices, are protesting loudly (p. 66), and the Reconstruction Finance Corp. which holds the mortgage on Kaiser's Fontana, Calif., steel plant has been asked to intervene. Consumers say they can't pay such a price increase and stay in business. Kaiser, who has been trying to get the government to write off part of this mortgage, says that without the price boost it can't pay its debt. Move appears to be Kaiser's strategy to force a cut in the mortgage.

CONFUSING— Not only is industry unsure as to what pricing methods are legal but so is the Federal Trade Commission. Principal phenomenon (p. 67) to engage attention of a Senate subcommittee studying status of pricing systems under antitrust laws is the difference of opinion within the FTC on question of meeting competitors' delivered prices. It appears likely subcommittee will insist to Congress that the FTC compose its present differences as to what is legal or illegal in absorbing freight.

HERE AND THERE IN INDUSTRY— New wrinkle revealed in steel gray market investigation is use of dummy firms (p.67) as front for parent company . . . Because of shortage of coking coals the U. S. Bureau of Mines is preparing a list (p.70) of those that could be developed for use in an emergency . . . To offset adverse effects of the steel industry's shift to f.o.b. mill pricing, Youngstown Sheet & Tube Co. (p. 72) is establishing division to attract steel consumers to locate near mills . . . Work is expected to start in December on making the upper Monongahela river navigable (p.72), a project which would bolster metallurgical coal supplies for Pittsburgh district steel mills . . . Change in the steel industry's pricing system appears likely to eliminate quality and service (p. 75) as deciding factors in purchases in the automotive industry . . . Bethlehem Pacific Coast Steel Corp.'s bolt and nut output is being boosted (p. 78) by new Seattle plant.

Engineering News, P. 89 *Market Summary, P. 143*



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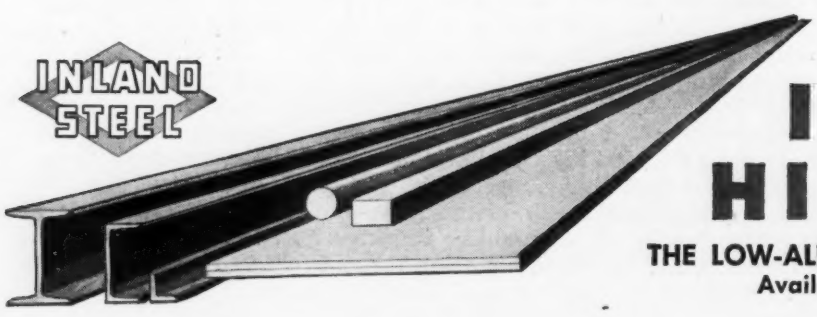

INLAND HI-STEEL

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STEEL
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PREPAREDNESS: Old State Department building, headquarters of the National Security Resources Board, is beehive of activity as defense measures take form

Organizational Blueprint for Defense Emerging

Nucleus setups for wartime administrative agencies set up by National Security Resources Board as plans to meet any future emergency take definite form

REMINISCENT of wartime Washington with its War Production Board and other agencies, men from industry again are being assembled in numbers in the capital as the nucleus of the staff that will direct industry in event of another war emergency.

These men now occupy offices in the new headquarters of the National Security Resources Board in the old State Department building across the street from the White House, and all are preparing procedures to be followed in event of another war.

The NSRB was created under the National Security Act of 1947 to advise the President on all aspects of war mobilization. Chairman Arthur M. Hill, in preparing for any eventuality, has created nucleus setups for an Office of War Production, an Office of War Transportation, an Office of War Manpower and an Office of Economic Stabilization.

The organization Mr. Hill is creating in the NSRB would take care of all the wartime functions which were handled in World War II by the War Production Board, the Office of Price Administration, War Manpower Commission, National Labor Relations Board, Office of Defense Transportation, Maritime Commission, Reconstruction Finance Corp. and a host of agencies and administrations handling housing, rubber, coal, oil, etc.

In appointing men to key jobs, the NSRB has given preference to those who had active experience in World War II, and who have the approval of trade associations in their industries—when such trade associations exist. His chief advisory consultants are as follows: Bernard M. Baruch, on general mobilization problems; Ferdinand Eberstadt, New York banker, on general production problems; Fred E. Henderson, Western Electric Co., on plant locations and plant dispersal; Edward Falck, consulting engineer, on power and other utilities; Wallace E. Pratt, Standard Oil of New Jersey, and J. Melville Sands, on petroleum and petroleum products; R. J. Wysor, former president Republic Steel Corp., on steel industry problems; Gilbert C. Jacobus, on wartime censorship; Edmond F. Wright, on procurement of additional executive personnel.

Executive Assistant—Mr. Hill's executive assistant is Major General C. F. Robinson, top staff officer of General Somervell's Army Service Forces

DECENTRALIZED CONTROL

War emergency planners of the National Security Resources Board are flirting with the idea of a decentralized Office of War Production.

Instead of assembling vast personnel in a Washington structure—as the Social Security and adjacent buildings in World War II—the various divisions would be scattered throughout the country, preferably in small cities. A favorite location would be college towns which would have ample office, conference room and living facilities.

This same concept of decentralization also is being studied by the Commission on Government Reorganization headed by former President Hoover.

during World War II. His director of plans and programs is Ralph J. Watkins, Dun & Bradstreet Inc., and his director of mobilization procedure and organization, William A. Gill. Chief economist, under Mr. Watkins, is Glenn E. McLaughlin, Bureau of Reclamation, while Dr. David Novick, University of Puerto Rico, heads the program branch under Mr. Watkins.

The director of production, slated in wartime to become director of the Office of War Production—in other words, the counterpart to the chairman of the War Production Board of World War II—is George E. Felton, Boston industrialist. Under Mr. Felton, the manufacturing group is headed by Frank M. Shields, American Optical Co.

Readers of STEEL will be especially interested in the men filling key jobs under Mr. Shields, for all of them are well known in their industries. Acting as a team in charge of the tools and equipment sections are two men of wide experience in machine tools, Brig. General E. Reimel and Navy Captain E. R. Henning, both retired. Under them have been appointed the following: Wallace T. Montague, Worcester, Mass., abrasives; Lee C. Wilson, Reading, Pa., foundry products and equipment; Lee Wilson, Cleveland, industrial furnaces and ovens; Anthony Mulac, Alliance, O., cutting tools; Henry Sahlin, Birmingham, Mich., hydraulic and mechanical presses and possibly later on forging hammers; Franz T. Stone, Tonawanda, N. Y., materials handling equipment of all descriptions.

Other Appointments—Other men so far appointed to head industry sections under Mr. Shields are Frederic S. Glover who, as in World War II, heads up the automotive section.

Under Mr. Felton, and proceeding under the direction of Edward Falck of Mr. Hill's top advisory staff, are Robert Wardell Jr., power and other utilities, and Leighton Peebles, communications.

In Mr. Felton's materials group only two appointments have been made to date: Navy Captain Thomas Kelly, petroleum and natural gas, and William T. Hack, Ethyl Corp., chemicals.

Dr. L. Carmichael, president of Tufts College, is director of human resources and slated to head up the Office of War Manpower in event of another war. His assistants are James C. O'Brien, manpower, and Dr. James A. Crabtree, medical services.

Dr. Ewald T. Grether, former dean of the School of Commerce & Business Administration, University of California, is director of economic management, and slated to become head of the Office of Economic Stabilization.

FAST SERVICE: A speedup fueling system for jet planes is being effectively used by First Air Force's F-84 Thunderjet fighters. New system refuels 20 jet planes in 90 minutes, compared with 30 minutes for fueling a single plane by the conventional mobile unit of 2000-gallon capacity. With the new method, a portable hose cart, right, draws fuel from hydrants connected to 25,000-gallon tanks. NEA photo

Military Plane Program Pushed

Air Force and Navy given green light on 4262 new aircraft, 2201 now being under order by Air Force and 1165 by the Navy

ON AN authorization under the supplemental national defense appropriation act, which became law about two months ago, the Air Force and Navy were given the green light on 4262 new aircraft, 2727 for the Air Force and 1535 for the Navy, of which 2201 of the former have been ordered and 1165 of the latter.

The orders will cost almost $2 billion, or an average of about $500,000 each, if it is assumed about 15 per cent of the total money goes for spare parts, technical data and various tests. It includes engines, radio, armament and all the other complicated GFP devices which, on an average, comprise half a plane's cost.

Costs Are Higher—In a comprehensive analysis of the program, North American Aviation Inc., Los Angeles, which received orders for 770 planes in three types, plus an unspecified number of one confidential type, points out present airplane costs are higher because relatively small quantities are ordered, because research and development are more costly in the present high-performance range, because airplanes are more complex and difficult to build and because labor rates and materials costs have risen sharply.

Young Company—North American is a comparatively young company in a young industry. When the present main plant was occupied back in 1936 there were only 150 employees, about 160,000 sq ft of floor space and a backlog of $1 million in orders. Growth skyrocketed during the war when the company delivered 38,200 airplanes from four large plants, including two in Dallas, Tex., and one in Kansas City. Employment rose from 5800 in 1940 to 88,000 in 1944, dropped to 5000 in 1946 and is now back to 22,000. Order backlogs were $83 million in 1940, zoomed to $1290 million at the wartime peak, fell to only $36 million at one point in 1945 and are now back to $418 million, almost all for the military services.

More Than Appropriations Act—The Defense Appropriation Act for aircraft did more than appropriate money and authorize contracts. Among other things, it removed the two-year time limit on the new funds and authorizations; they are now available until spent, facilitating long-range planning and procurement, as well as steadying work loads in producing plants. Also in the act are new renegotiation provisions which North American believes will restrict high earnings in the years ahead to offset losses experienced by manufacturers in the postwar period. However, with an order backlog for 1100 planes now in hand, the company looks for stabilized operations.

For many years, General Motors Corp. was the largest stockholder of North American Aviation, owning 1,000,061 shares or 29 per cent of the capital stock. Remaining stock was held by 28,200 holders. On June 3

General Motors sold all its shares to the public through underwriters at $12.75 per share, increasing the number of NAA stockholders to over 31,100.

Other Contracts Placed—In addition to the North American orders, the Air Force and Navy have placed contracts for the following with other manufacturers:

Boeing: 132 B-50B bombers and 30 B-50C, larger and more powerful refinements of the B-29.

Curtiss: 58 F-87 fighters of the four-jet all-weather type, now being tested, and 30 RF-87A, photo reconnaissance version.

Douglas: 28 C-12A cargo carriers, improved version of the four-engine C-54; and for the Navy, 356 AD-1 single-engine attack bombers, and 28 F3D twin-jet fighters.

Fairchild: 99 C-119B cargo carriers, improved version of the C-82 Packet; for the Navy, eight R4Q cargo ships, Navy version of the C-119.

Grumman: 32 SA-16A twin-engine search-rescue amphibians; for the Navy, 317 F9F fighters, 23 AF torpedo bombers and six JR2F search-rescue amphibians.

Lockheed: 457 F-80C single-engine Shooting Star jet fighters, and 128 TF180 two-place jet trainers; for the Navy, 82 P2V-2 twin-engine patrol bombers.

Martin: 47 AM attack bombers for the Navy.

McDonnell: 179 F2H twin jet carrier-based fighters for the Navy.

Northrop: 30 B-49 eight-jet flying wing bombers.

Republic: 409 F-84C single-engine jet fighters.

United (Sikorsky): 18 HO3S and 19 HJS helicopters for the Navy.

United (Chance-Vought): 33 F6U and 19 F7U single-jet fighters for the Navy.

Standby Plant Program Starts

"DETERRENT to reckless calculations by a potential aggressor" is the phrase applied to the national industrial reserve of war plants being set up by Federal Works Agency.

The National Industrial Reserve Act authorized FWA to take over, repair, maintain and preserve in stand-by condition certain specialized government-owned war plants and machine tools and other equipment. These plants and equipment, after selection by the secretary of defense, will be cared for by the Division of Industrial Properties of the Public Buildings Administration of FWA. PBA's commissioner, W. E. Reynolds, in setting up this division named C. D. Williams its acting director.

Shipbuilding Revives

Navy and Maritime Commission announce construction and modernization programs

TENSENESS in the international situation is being accompanied by revival of shipbuilding programs.

The Navy plans 16 new vessels, is taking steps to keep private shipbuilding yards in readiness for any emergency, and is revamping and modernizing a number of warships. Meanwhile, the U. S. Maritime Commission is promoting plans to build 20 tankers and seriously discussing a passenger ship rehabilitation program.

Although they are aimed at ultimately strengthening the national security, these activities will have an immediate effect of cutting in on the already tight supply of both manpower and steel.

Navy's Program—Total cost of the Navy's 16-ship program is estimated at $390,400,000 and consists of the following: A flush deck 65,000-ton aircraft carrier to be built for $124 million by Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

Two antisubmarine cruisers, each costing $37,700,000 with one to be built by New York Shipbuilding Corp., Camden, N. J., and one by Philadelphia Naval Shipyard, Philadelphia.

Four destroyers, each costing $26 million, with two to be built by Bethlehem Steel Co., Quincy, Mass., and the other two by Bath Iron Works, Bath, Me.

Six high speed submarines, each costing $11 million, with three to be built by Electric Boat Co., Groton, Conn., and the other three by Portsmouth Naval Shipyard, Portsmouth, N. H.

Three antisubmarine submarines, each costing around $7 million, with one to be built by New York Shipbuilding Corp., one by Electric Boat Co., and one by Mare Island Naval Shipyard, Vallejo, Calif.

Eleven of the 16 vessels are to be built in private shipyards in a move to bolster the nation's lagging shipbuilding industry and keep a nucleus of design and building capacity ready for any emergency.

The Navy's postwar program also includes conversion and modernization of 33 ships. This work, much of it already assigned, is being done in Navy shipyards.

Government To Help—Under the U. S. Maritime Commission's program, which is designed to benefit the merchant fleet and also make ships available for national defense, shipping companies are being asked to build 20 tankers with government financial aid. The tankers are estimated to cost from $9 million to $10½ million each, with the government providing $2½ million each to provide a special feature that would make them high-speed vessels and valuable for national defense purposes.

Although the country has its greatest tanker fleet in history and current construction orders cover 50 more large oil carriers, the Secretary of the Navy told the House Merchant Marine Committee early this year that in event of a national emergency the country would be short 116 tankers in the first year of such an emergency. The U. S. now has 9,500,000 tons of tankers, representing nearly 43 per cent of the world tanker fleet.

Report Armament Contracts Let

UNCONFIRMED reports have been heard around Detroit that both Ford and Chrysler have been given important armament contracts. Unless they are for aircraft components, it it difficult to conceive the nature of such business, since these companies have little available space to accommodate military contracts, and there seems no real reason why they should be kept secret if they have been placed.

Expect Drop in Capital Needs

CAPITAL expenditures by industry in 1949 are expected to show a downward trend, according to survey by National Industrial Conference Board.

High construction costs are one reason for the expected decline. Another reason for tapering off of capital needs is completion of postwar improvement plans.

Rearmament program is not expected to increase capital needs of most companies surveyed.

Armco Buys Jackson Tube Co.

ARMCO Steel Corp., Middletown, O., has contracted to purchase the assets of Jackson Tube Co., Piqua, O.

The Piqua company will be operated as the Tubing Division of Armco effective Sept. 1. Samuel E. Jackson, its president and founder, will become the manager of the new division.

Jackson Tube manufactures mechanical tubing in sizes ranging from ⅜ inch to 3 inches. The company was established in Piqua in 1940, and its equipment includes seven automatic tubing machines using continuous resistance welding.

Employment Sets New High Marks

All-time peaks reached by nonagricultural and civilian employment and size of civilian labor force. Growth in number of new businesses alters occupational distribution

THREE new all-time high marks in labor and employment were reached recently in the United States. They are: Nonagricultural employment of 52,452,000 persons; a civilian labor force of 63,842,000; and a civilian employment figure of 61,615,000.

These estimates were prepared by the U. S. Department of Commerce and are for the week of July 4-10.

At New Peak—At its new peak, nonagricultural employment is 553,000 persons above that of the week of June 6-12 and 2,439,000 over that of the week of July 6-12, 1947. The new high mark in the civilian labor force represents a gain of 363,000 over the week of June 6-12 and 1,178,000 over the week of July 6-12, 1947, while the new civilian employment record is 319,000 over the previous high reached in the week of June 6-12 and 1,536,000 over the week of July 6-12, 1947.

Contributing importantly to the increase in nonagricultural employment was the addition of many young seasonal workers. Their entrance into nonagricultural employment also was largely responsible for the rise in civilian labor force figures, which include both the employed and unemployed.

Changes Reflected — The occupational distribution of the civilian labor force has changed in many respects in the three years since the end of the war. Of the expansion of this force by about 8½ million persons, half has occurred in three of the smaller occupational groups—professional and semiprofessional workers; nonfarm proprietors, managers and officials; and the sales occupations. This, says the Department of Commerce, reflects establishment of an unusually large number of new, small businesses and professional practices in the postwar period and the general upswing in trade.

While employment in early July was above that of early June, unemployment also was up slightly. This was possible because the nation's population also is on the upgrade, the country's total noninstitutional population (above 14 years of age) having grown from 107,504,000 in early July, 1947, to 108,346,000 in the week of June 6-12, 1948, and to 108,597,000 in the week of July 4-10, 1948.

Unemployed persons during the week of July 4-10 were estimated at 2,227,000, compared with 2,184,000 in the week of June 6-12. However, these figures are substantially below the unemployment mark of 2,584,000 in the week of July 6-12, 1947.

Hourly Wages Continue Uptrend

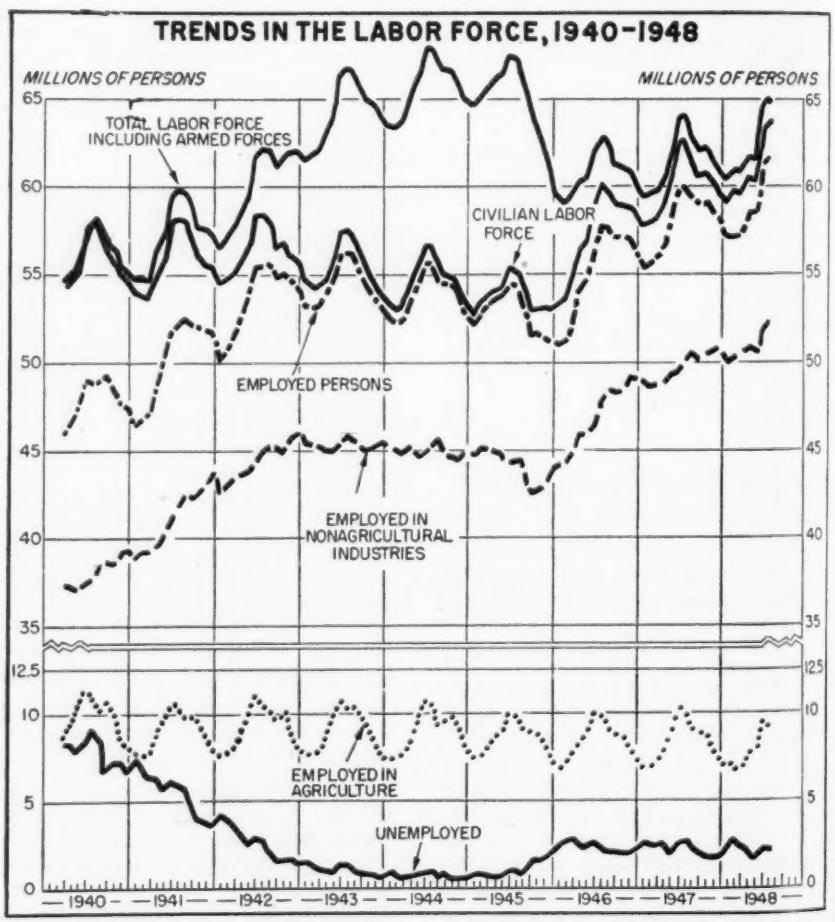
AVERAGE hourly earnings of production workers in 25 manufacturing industries during May marked their 28th consecutive monthly advance, according to a survey by the National Industrial Conference Board.

The hourly average for the month was $1.433, a gain of 0.7 per cent over April and the largest monthly rise since September, 1947.

Despite the gain in average hourly earnings, production workers experienced a drop in weekly earnings due to a decline in hours worked. The May average of $56.86 was 24 cents or 0.4 per cent less than the April weekly earnings. Real weekly earnings, adjusted for changes in the consumers' price index in terms of 1923 dollars, shrank 1 per cent in May from April and 2.5 per cent from May of last year. Since August, 1939, real earnings rose 26.5 per cent.

UN Scrap Survey Holds Cheer

BROAD conclusions over the European scrap situation have been arrived at by United Nations' experts as the result of a recent survey. These are (1) that original estimates of 10 million tons of available scrap in Germany have not been overly optimistic; (2) that a fairly sizable amount of this scrap could be exported to the United States without harm to the western European economy; (3) that England and Italy stand in greatest need of scrap of the various western European nations; and (4) that certain European countries, other than



An increase in the nation's population and a high level of industrial activity, along with other economic factors, have pushed the U. S. Commerce Department's estimates of the current civilian labor force, civilian employment and nonagricultural employment to new all-time peaks

Germany, have at least a modest excess supply, which could be used to relieve neighboring countries.

Hiram Winternitz, president, Charles Dreifus Co., Philadelphia, is the American representative on the UN commission making the survey.

Autos Lead in Steel Usage

THE AUTOMOTIVE industry continued through February the leading consumer of steel, according to the American Iron & Steel Institute, New York. That industry received 758,008 net tons, or 15 per cent of the 5,046,115 tons shipped in February. In January its receipts were 835,374, or 15.4 per cent of the month's mill shipments of 5,401,438 tons.

Other top users remained in the same relative positions in February as in January. They are: Construction, second, with 528,377 tons; rail transportation, third, with 396,219 tons; and containers, fourth, with 359,583 tons.

Jobbers, dealers and distributors received 878,156 tons in February, or 17.4 per cent of all mill shipments, compared with 924,650 tons, or 17.1 per cent, in January.

Exports accounted for 305,018 tons, or 6 per cent of all mill shipments in February.

Largest consumer of alloy (other than stainless) was the automotive industry which in February received 123,670 tons out of total mill shipments of 347,881 net tons. Principal product in alloy shipments was hot-rolled bars, at 141,583 tons.

Leading consumer of stainless steel was the appliances, utensils and cutlery industry which received 3144 tons out of total mill shipments of 22,048 tons in February.

July Steel Output Declines

STEEL production in July dropped below that of June but exceeded that of July, 1947.

Operating at 88.8 per cent of capacity in July, the steel industry, according to an American Iron & Steel Institute report, produced 7,078,123 net tons of ingots and steel for castings, compared with 7,256,354 tons in June when operations were at 93.8 per cent of capacity. The decline in July was the result largely of idleness at coal mines. In July, 1947, with operations at 85.1 per cent of capacity, output was 6,578,685 tons.

Production in the first seven months of 1948 aggregated 50,145,401 tons, compared with 48,917,242 tons in the like period of 1947.

Steel Product Shipments Gain

SHIPMENTS of finished steel increased 155,399 tons further in June to a total of 5,476,774 tons from 5,321,375 tons in May, according to the American Iron & Steel Institute New York. This compared with 5,263,711 tons in June, 1947.

Shipments of high-speed and tool steel bars, excluding hollow drill steel, totaled 7720 tons in June, making the total for the first six months 43,453 tons.

Shipments of stainless and alloy steel products amounted to 417,464 tons in June, including 35,770 tons of stainless, making the total for the first six months 2,446,360 tons.

SHIPMENTS OF FINISHED STEEL PRODUCTS FOR JUNE AND YEAR TO DATE

Steel Products	Number of companies	Items	JUNE - 1948			To Date This Year			Whole Year 1947		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	43	1	236,368	4.3	278,651	*1,529,028	4.7	*1,609,161	2,966,748	4.7	2,396,343
Structural shapes (heavy)	12	2	372,396	6.8	1,293	2,077,006	6.4	14,161	4,436,129	7.0	2,640
Steel piling	4	3	24,033	0.4	387	145,883	0.5	395	324,224	0.5	23
Plates (sheared and universal)	29	4	592,099	10.8	33,507	3,381,812	10.5	193,828	6,345,216	10.1	219,227
Skelp	6	5	11,098	0.2	39,688	74,044	0.2	205,748	160,989	0.3	384,004
Rails—Standard (over 60 lbs.)	4	6	173,107	3.2	1,433	973,284	3.0	5,956	2,207,146	3.5	991
—All other	5	7	15,948	0.3	36	118,933	0.4	708	211,900	0.3	329
Joint bars	7	8	11,575	0.2	4,302	71,438	0.2	20,492	173,923	0.3	15,198
Tie plates	7	9	43,388	0.8	50	248,886	0.8	261	504,779	0.8	4,437
Track spikes	8	10	13,319	0.2	43	70,777	0.2	139	163,746	0.3	146
Hot Rolled Bars—Carbon	34	11	524,725	9.6	54,882	3,089,895	9.6	316,242	6,242,416	9.9	745,770
—Reinforcing—New billet	16	12	107,606	2.0	976	661,596	2.1	3,809	1,277,975	2.0	9,775
—Rerolled	13	13	19,619	0.3	-	101,011	0.3	-	175,833	0.3	-
—Alloy	27	14	153,835	2.8	21,316	* 934,793	2.9	117,565	1,741,432	2.8	212,382
—TOTAL	44	15	805,785	14.7	77,174	*4,787,295	14.9	437,616	9,436,756	15.0	967,927
Cold Finished Bars—Carbon	27	16	108,756	2.0	513	661,092	2.1	2,727	1,426,701	2.3	9,249
—Alloy	26	17	20,379	0.4	958	109,561	0.3	2,963	218,802	0.3	2,601
—TOTAL	35	18	129,135	2.4	1,471	770,653	2.4	5,690	1,645,503	2.6	11,850
Tool steel bars	18	19	7,438	0.1	282	42,534	0.1	919	87,279	0.1	1,670
Pipe & Tubes—Butt weld	15	20	171,538	3.1	2,357	965,956	3.0	12,152	1,892,691	3.0	78,080
—Lap weld	8	21	24,275	0.5	-	169,065	0.5	3	389,762	0.6	875
—Electric weld	13	22	121,091	2.2	346	734,658	2.3	2,559	1,254,325	2.0	4,274
—Seamless	17	23	248,594	4.5	14,608	1,433,069	4.5	85,217	2,581,106	4.1	157,208
Wire rods	20	24	54,301	1.0	28,440	322,070	1.0	155,954	667,282	1.1	331,192
Wire—Drawn	39	25	230,416	4.2	15,364	1,351,161	4.2	90,747	2,590,963	4.1	181,783
—Nails and staples	17	26	73,677	1.4	1,139	433,034	1.3	7,177	799,436	1.3	8,481
—Barbed and twisted	15	27	22,018	0.4	23	132,597	0.4	73	256,991	0.4	128
—Woven wire fence	13	28	37,003	0.7	359	204,970	0.6	1,805	407,295	0.6	3,616
—Bale ties	11	29	11,290	0.2	-	61,761	0.2	-	119,917	0.2	-
Black Plate—Ordinary	9	30	70,553	1.3	92	395,699	1.2	654	801,745	1.3	2,033
—Chemically treated	2	31	1,268	-	-	7,608	-	-	19,252	-	-
Tin and Terne Plate—Hot dipped	8	32	182,412	3.3	48	1,011,201	3.1	167	2,093,149	3.3	228
—Electrolytic	9	33	151,444	2.8	-	862,101	2.7	215	1,617,659	2.6	529
Sheets—Hot rolled	32	34	637,585	11.7	53,988	3,826,170	11.9	325,356	7,891,798	12.5	578,426
—Cold rolled	16	35	526,929	9.6	1,499	3,285,116	10.2	9,809	5,504,578	8.7	28,498
—Galvanized	16	36	137,074	2.5	226	807,774	2.5	1,550	1,609,881	2.5	889
Strip—Hot rolled	23	37	138,690	2.5	26,806	820,417	2.6	171,142	1,740,085	2.7	308,655
—Cold rolled	34	38	152,252	2.8	1,671	874,228	2.7	11,942	1,613,005	2.6	28,030
Wheels (car, rolled steel)	5	39	29,303	0.5	96	163,307	0.5	621	356,873	0.6	2
Axles	5	40	19,372	0.4	14	102,398	0.3	97	185,019	0.3	53
All other	-	41	-	-	-	-	-	-	-	-	-
TOTAL STEEL PRODUCTS	140	42	5,476,774	100.0	585,393	*32,255,933	100.0	*3,378,314	63,057,150	100.0	5,717,765

*Adjusted.

Price Boost Stuns West

$30-a-ton increase by Kaiser Co. on steel viewed as knockout blow to western industry

SAN FRANCISCO

HUNDREDS of West Coast steel consumers will be squeezed in the cost-price pincers by Henry J. Kaiser's recent $30-a-ton increase on steel products of his Fontana mill.

The increase, effective Aug. 15, is in addition to recent boosts of $9.83 a ton Kaiser made last month to offset a 13-cents-an-hour wage increase and also upward adjustments due to the shift to f.o.b. mill pricing.

For many consumers the price increase may be disastrous because Fontana is their sole supply source.

Users Protest—Kaiser's move has brought protests from users. "It's a knockout blow to western industry, delivered by the man who talked so loudly about what he was going to do to build up western industry," said Kenneth Norris, chairman, Western States Steel Council and president of the Norris Stamping & Mfg. Co., Los Angeles. The council asked the Reconstruction Finance Corp., which holds the mortgage on the mill, to persuade Kaiser to defer the increase.

Mr. Norris cited his own business, which is producing wheels for California auto assembly plants.

"A $30-a-ton raise on steel would put us out of the wheel business," he said. "Before the last steel price increase, finished wheels were selling for about $180 a ton, with a profit of 10 per cent per ton if you were lucky. With a profit of only $18 a ton, you can see what another steel price increase will do."

Move Is Gamble—It was admitted the price boost is a gamble on the length of time the sellers' market will last. Although Kaiser men hesitate to put a limit on this time element, several expressed the belief two years is the minimum needed to bring Fontana into safe financial waters.

Although the Kaiser Co. announced it was raising prices "an average of $30 a ton," no price lists have been issued to cover individual products. Mr. Kaiser indicated, however, that prices on different products may vary widely. Thus price advances on some items will average more than $30 a ton; on others, less.

As Kaiser's prices already were above those quoted by other Western steel mills, the difference in some prices as a result of the latest advance may assume astronomical proportions. For instance, carbon plates are being quoted at $68 a ton by Columbia Steel Co., while Kaiser's price before the latest increase has been $86 a ton. Adding $30 will bring the Fontana price to $116 a ton.

Seeks Debt Reduction—The reason given by Mr. Kaiser for the boost is the heavy debt hanging over Fontana. The mill was constructed with approximately $123 million of RFC funds. When the war ended Mr. Kaiser took over the plant and assumed the full obligation. Present unpaid balance of the loan is approximately $100 million. Last year Mr. Kaiser sought an $85 million write-off of the loan. The RFC refused.

In announcing the price increase, Mr. Kaiser said the advance was made to enable Fontana to repay its debt to the government 100 cents on the dollar. He also said no return on invested capital would be possible until the capital structure is reduced to a level where it could be privately financed.

To Study Steel Freight Rates

INVESTIGATION of the effects of recent freight rate inceases and changes of the basing point system to an f.o.b. mill price basis on the western steel producing and consuming industry will be started soon by the Interstate Commerce Commission.

It will hold hearings in San Francisco on iron and steel freight rates from Utah to Pacific Coast points. The hearings will begin Oct. 25. Interested parties will have until Sept. 15 to file exhibits and statements.

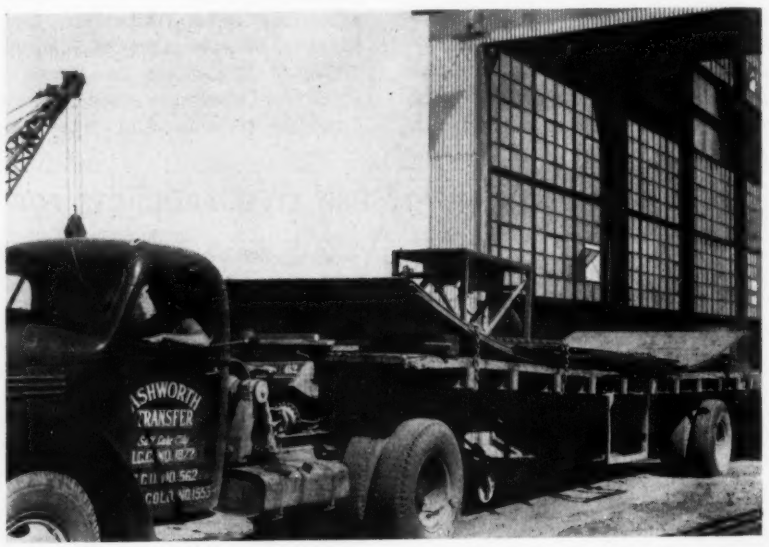
"Skins" Blooms at Rapid Rate

FIRST fully automatic flame scarfing machine for removing surface defects from steel blooms, recently installed at the Pittsburgh works of Jones & Laughlin Steel Corp., processes a 60-ft bloom in less than a minute. Built by Linde Air Products Co., New York, the unit completely "skins" the four sides of 7 x 8½-inch blooms, removing light scabs and seams.

Entire cycle of operation, from positioning the bloom in the machine to flame cutting, until the desurfaced metal emerges, is automatically controlled. The bloom is positioned by a unique arrangement of three electric eyes. As it enters the machine, the photo-electric cells stop the bloom, and adjust it to exact position to start flame scarfing.

After bloom is positioned, surface metal is heated to kindling temperature between two 6-nozzle and two 7-nozzle heads with a mixture of oxygen and acetylene. When kindling temperature is reached, a flat, practically continuous stream of pure, dry oxygen is turned on and the bloom is moved at a controlled speed of 130 feet per minute through the machine.

Added feature of the new machine is the compact head and nozzle arrangement allowing for fast replacement of cutting tips.



FIRST SHIPMENT: Initial load of plates fabricated at Chicago Bridge & Iron Co.'s new steel plate fabricating plant at Salt Lake City, Utah, is leaving Shop No. 1. To be built soon are Shop No. 2 and an outside crane runway

New Gray Market Wrinkle

Dummy firms front for parent company in selling high-priced steel, Macy Committee told

NEW wrinkle in steel gray marketing was revealed last week when the Macy Committee to Investigate Questionable Trade Practices questioned witnesses about methods of the Century Steel Corp., Chicago. This corporation, it was shown, made the great bulk of its 1947 and 1948 steel sales at premium prices, but hid its identity by sending out invoices under the names of dummy corporations.

"We would tell the customer over the phone that we did not have the steel, but that maybe we could locate some," explained William M. Shaeffer, the company's Pittsburgh district sales manager. Subsequently, said Mr. Shaeffer, the steel, if available, would be shipped and invoiced in the name of one of the dummies.

Explaining the reason for the creation of the dummy corporations early in 1947, Myron Hokin, executive vice president, Century-America Corp. said: "We felt it would be easier to consummate a sale if our salesmen said the steel belonged to one of these companies."

Double-Barreled Deal—As an illustration, a double-barreled deal with a blower company in Dayton, O., was mentioned. Century bought coil strip stock from this company in its own name at 6.50c and simultaneously sold to the same company through one of the dummy subsidiaries a tonnage of sheet at 16.50c.

Century's dummy subsidiaries, according to a list put in the record by John Reddan, committee counsel, were 27 in number. The names follow:

The Anders-Central Co., Baker Fox Corp., Blanton-Ives Co., Carter-Cornell Inc., Chase Bishop Corp., Chippewa Metals Co., The Coral Corp., Craig, Wetmore Inc., The Esko Co., (formerly Conley Corp.), Graham Corp., Hubbard Western Co., Jordan Connors Inc., Leeds-Root Associates Inc., Page Hollister Corp., Peck-Lorimer Inc., Powell Logan Co. Inc., Proctor Ames Inc., Quaid-Lemont Corp., Rowe Swain & Co. Inc., Stanton-Lister Corp., Winslow-Tripp Inc., Releigh-Sherman, Trumbull Porter Inc., Sinten Cole Corp., Barr Krum Metals Co., Sanford & Buhl Co., Cannon Inc.

Protest Steel Allocations

SEVERE criticism of the proposed voluntary plan for the allocation of steel requirements of the Armed Forces was expressed in a letter written to Commerce Secretary Charles Sawyer by Rep. Walter G. Ploeser (Rep., Mo.), chairman of the House Small Business Committee. Proposed plan as now envisioned would "virtually eliminate small business from all participation in the procurement program," he stated.

Last week Commerce Secretary Sawyer announced allocation of 58,000 tons of steel to the prefabricated housing industry had been approved. This allocation, which was referred to Sawyer for final action by the industry committee, is vigorously opposed by many manufacturers who have lodged protests with the Commerce Department.

EXPORT LICENSING

Manufacturers denied licenses to make deliveries against orders booked from Russian and other Iron Curtain countries prior to Mar. 1, 1948, may now submit to the Economic Co-operation Administration particulars about the goods held up. Complete specifications of each item should be sent the ECA's Industry Division which will circularize Marshall Plan countries in search of buyers.

ECA now is circularizing an assortment of machine tools originally ordered by Russia and other Iron Curtain countries.

Discuss Trucking Problems

CONFERENCES between military transportation authorities and trucking industry officials in the western states to discuss common problems will begin Aug. 17 at Los Angeles. E. F. MacMillan, chief of the government traffic section of American Trucking Associations Inc., Washington, will represent the national association at the conferences. Major A. W. Higgins will serve as general spokesman for all military services.

Besides the meeting at Los Angeles, additional meetings will be held at San Francisco, Aug. 20; Portland, Oreg., Aug. 24; Seattle, Aug. 26; Salt Lake City, Utah, Aug. 31 and Denver, Sept. 2. Questions to be discussed will include routing and traffic distribution, rate policy and procedure, operational problems, claim prevention, fiscal matters and Government Accounting Office procedures.

FTC Opinion Divided

Views within commission on freight absorption in quoting prices vary between two schools

PRINCIPAL phenomenon to engage the attention of Senator Capehart's subcommittee studying the status of pricing systems under the antitrust laws is the difference of opinion within the Federal Trade Commission on the question of meeting competitor's delivered prices.

One school of FTC thought, which prevailed in the order to the cement industry, holds there shall be a single f.o.b. price at each producing point, with the result that a consumer must buy from the most favorably located mill unless he is willing to pay higher delivered price.

The other school holds competitors legally may match each others' delivered prices, absorbing freight disadvantages in so doing. This latter school sees nothing wrong about deviating from regular f.o.b. mill prices under such circumstances.

Majority View—The first school, apparently representing the views of the majority of the Federal Trade Commission attorneys, is the one that wrote the brief recently submitted by the FTC in the famous Pittsburgh Plus case which has been pending since 1926.

This brief held it wrong for subsidiaries of the United States Steel Corp. to deviate from regular f.o.b. mill prices to meet competition at delivered points. It is this view, sustained by the Supreme Court in the cement case, that leading steel producers recognized in recently departing from their old multiple-basing-point delivered price system.

Represents Second School — The second school, which possibly would be approved by a majority of the commissioners today, seems to be represented largely by Lynn C. Paulson, trial attorney for the commission in the current case against the steel industry. Mr. Paulson recently offered to submit to the commission a proposed settlement under which steel companies would be free to meet each others' delivered prices.

While the Capehart subcommittee will examine thoroughly all angles of the situation, steering clear of trying to prove a case on the basis of preconceived ideas, it seems certain it will insist, in its report to Congress next year, that the Federal Trade Commission compose its present differences as to what is legal or illegal in absorbing freight.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Senator Ralph Flanders' analysis of President Truman's anti-inflation proposals provides much food for thought. Holds inflation cures lie only partly in federal jurisdiction

IT DID not get into the headlines, but the speech in which Sen. Ralph E. Flanders (Rep., Vt.) analyzed the President's anti-inflation proposals to Congress was one of profound significance for industry and labor.

It will not be read nearly as widely as it deserves—for, expressing the fruits of a long experience with bread-and-butter economics, it can be absorbed only after more penetrating reading and rereading than the average citizen is willing to devote to such works even though they deal with vitally important subject matter.

In reviewing the President's proposals, the former machine tool executive and Federal Reserve banker eschewed politics and leaned over backwards to be fair.

Sees Good and Bad—In the President's proposals he found much that was good, but he also found much that was bad or insufficient. Only in one instance did he see double-talk in the President's bill, the wage section of Title III. This looked to him like "an artfully mistitled section which relates to price control only." Like others, Mr. Flanders saw this section as covering only the conditions under which the President would permit price increases after wage increases had been granted either voluntarily or involuntarily.

Whatever action the Congress would take, he went on, he was convinced that the fundamental remedies for inflation lie only in part within the jurisdiction of government and that "a large burden of the responsibility of control lies with organized labor and with industry."

The big need right now is for education of the public to the fact that full employment, such as we have been having for some years, tends inexorably toward inflation—unless the parties creating inflation recognize and discharge their responsibilities. He pointed out by way of illustration that the existence of a considerable pool of unemployment automatically leads to deflation. The big question, therefore, is: "Can we have full employment without inflation?"

This question cannot be answered affirmatively, Senator Flanders went on, as long as labor lays the stress on increasing wages instead of production. It cannot be answered affirmatively until labor has a more realistic understanding as to the function of profits in our economy.

Cites Fallacy — "A fallacy which leads to harmful demands," he said, "is that corporate profits can be redistributed to employees on a generous scale. Those profits in 1947 amounted to about $28,700,000,000 before taxes—a very tidy sum indeed. Why not distribute the greater part of that in increased wages? For one thing, the government needs the $11,700,000,000 it collected in taxes, and the added billions it collected in double taxation on the dividends paid to stockholders. Furthermore, dividends must be paid if capital is to flow into production in a free economy; and about the only hope for a continued rise in living standards, apart from longer hours and increased worker efficiency, is a revised flow of profits into new materials and products and more efficient plants and equipment."

Labor could make a big contribution toward reversing the inflationary curve by asking Congress to amend the Fair Labor Standards Act to permit a longer work-week without payment of overtime rates; the act, he recalled, was passed in a time of acute unemployment to spread the work, and is inflationary in its effect. The effect of increased production would be increased competition leading to lower prices.

Soul-Searching Needed—"The most serious soul-searching must be done by the unions with the more highly-paid membership who customarily spearhead the demands for still higher wages," he went on. "These unions should rest on their oars. It is the low-income groups who must come up. As they are left further and further behind they have to concentrate all their energies on the bare necessities of minimum food, clothing, and shelter. They are lost as customers. They become a menace to prosperity. They are the hapless, hopeless means by which inflation in due time ends in a bust."

As to the manufacturer or merchant who in these delicate times "raises his prices to more than offset wages and material increases"—such a man is likewise driving our inflation into a disastrous and inescapable bust; he is throwing the free enterprise system overboard.

Senator Flanders' speech contained much other thought-provoking context. The whole food price support and production quota setup, he said, needs a thorough analysis and overhauling. Those wanting copies of the speech can get them by writing to Senator Flanders' office in the Senate Office building, Washington.

Employers Run Into Trouble

THAT the Fair Labor Standards Act and the Public Contracts Act continue to give plenty of trouble to employers is amply demonstrated by a report by William R. McComb, administrator of the Wage & Hour and Public Contracts Division, Labor Department.

Of the 30,053 employers inspected during the fiscal year ending June 30 last, 15,799, or more than half, were in violation. Of these latter, 9582 arranged to make restitution of $4,256,761 in back wages to some 100,000 employees. About 90,000 of these employees were owed back wages because they had not received overtime conpensation at time-and-a-half for work beyond 40 hours in a workweek. However, approximately 12,000 were owed back wages because the employers had failed to pay them at least 40 cents an hour at some time during the past two years.

Forum for Small Business

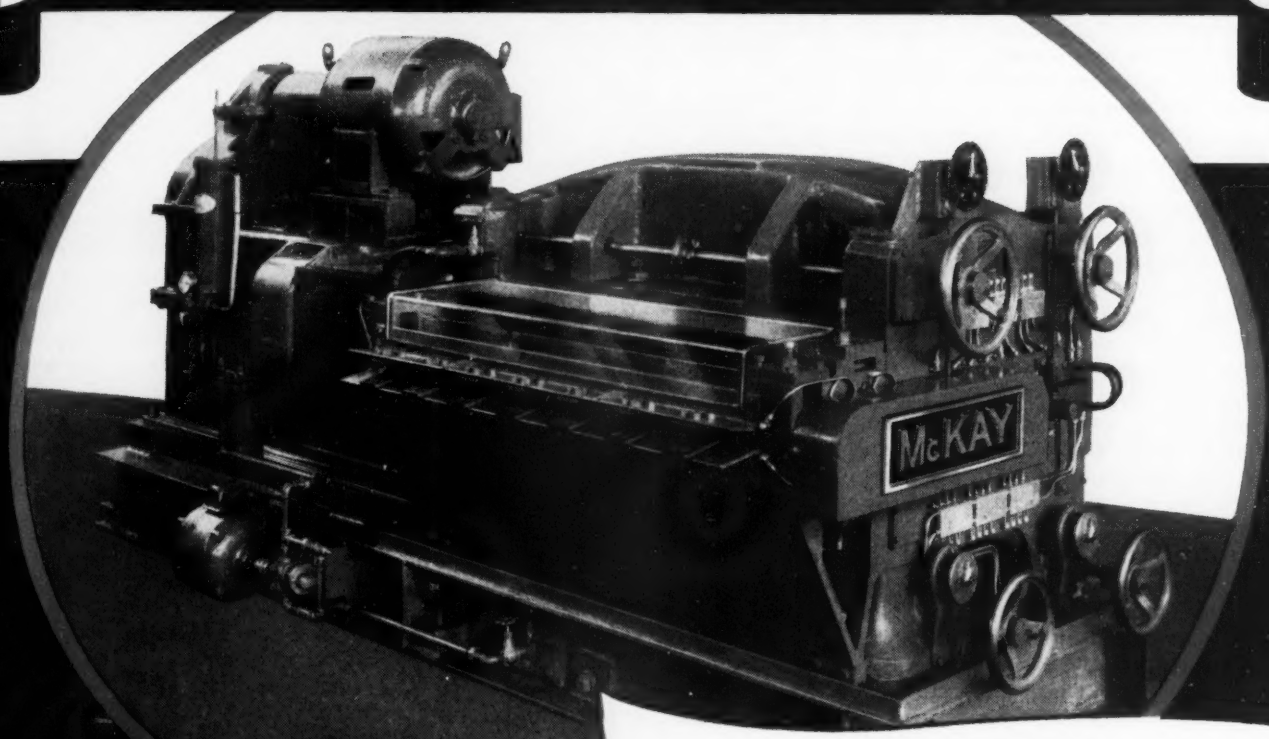
INCREASINGLY, the Senate Small Business Committee, of which Sen. Kenneth S. Wherry (Rep., Nebr.) is chairman, is serving as a forum for the airing of the troubles of small business interests. A good deal of this business is handled behind closed doors and the proceedings are not made public.

A closed meeting of this kind occurred on Aug. 4 when Senator Wherry, disturbed by persistent complaints about the proposed allocation of 59,000 tons of steel for prefabricated housing, called in all the interested parties.

These included not only the two speakers who opposed the proposed allocation at the recent public hearing—Dr. C. J. Rodman, Alliance Ware, Alliance, O., spokesman for the Formed Metal Plumbing Division

McKAY

BACKED-UP ROLLER LEVELERS



The McKAY

Backed-Up Roller Leveling Machine has extraordinary rigidity because its small diameter work rolls are supported by backing-up rolls. This type of leveling works the sheet more thoroughly.

Sheets processed on this type of leveler are strain relieved to a greater extent and have far superior stamping and drawing qualities than those processed by the ordinary leveler.

STANDARD FEATURES

Compact design reduces required floor space.

All adjustments are readily accessible to the operator.

Accurate indicating dials are provided for the screw downs.

Alloy steel helical gears are used throughout—all gears fully enclosed and running in oil.

Drive is through improved type McKay universal couplings.

Rugged construction insures continuous performance and low maintenance.

OPTIONAL FEATURES

One shot lubrication system.

Brushing rolls for cleaning strip—with built-in reservoir and spray system for solvent.

Entry or exit pinch rolls.

Sheet oiling system (on exit side of machine) with integral tank and oil distributing head.

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

PERFORMANCE . RUGGEDNESS . PRECISION AND SAFETY

of the Porcelain Enamel Institute, and R. C. Ingersoll, vice president, Borg-Warner Corp.—but Secretary Charles Sawyer of the Commerce Department, John Virden, director of the Office of Industry Co-operation, and officials of the Reconstruction Finance Corp. which financed the chief beneficiary of the allocation, Lustron Corp., with loans aggregating $25,500,000.

Steered by Senator Wherry, the meeting afforded a thorough airing of the views for and against the allocation, and of the extent and character of the government's interest in Lustron. At its close, Senator Wherry refused to make any recommendations one way or the other, but left it up to Secretary Sawyer to decide whether, in the light of the information that had been developed, the proposed prefabricated housing steel allocation should be finally approved or disapproved.

ECA Not a Purchasing Agency

BOOKLET, "American Business and European Recovery," which outlines the operations of the Economic Cooperation Administration and the purchasing procedures of participating countries, is available to those interested. Explaining that ECA is a financing agency and not a purchasing agency, the booklet points out that the American businessman's contacts should be with the foreign businessman, the foreign government and the export license office of the U. S. Department of Commerce.

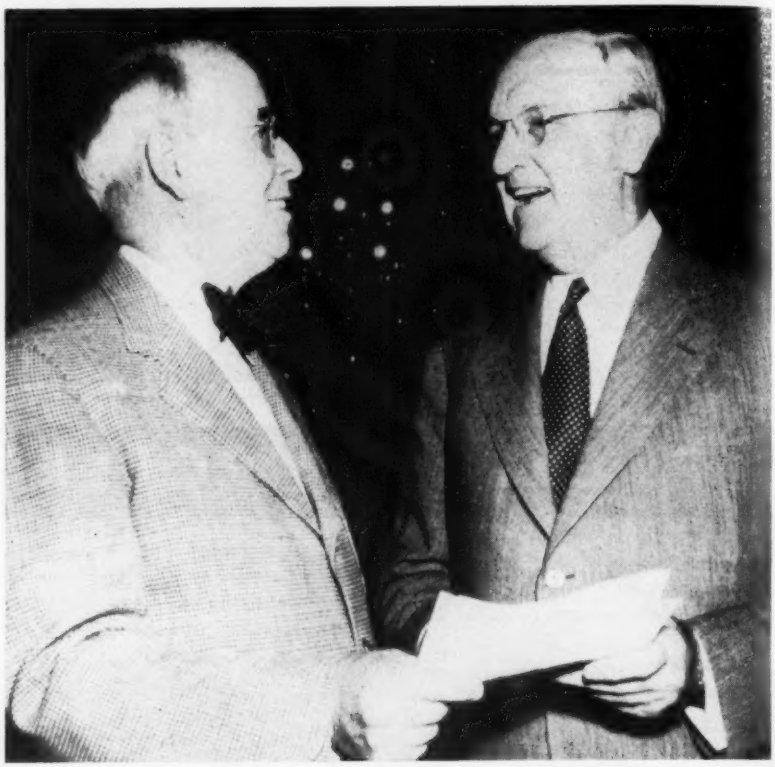
"After weighing the requirements of the participating countries, ECA issues procurement authorizations to those countries," the booklet says. "The manner in which the participating countries make their purchases follows no set general pattern. ECA is desirous of having purchases follow normal private trade channels to the greatest extent practicable."

The booklet briefly outlines the buying methods of the various participating countries and lists addresses of foreign purchasing missions and embassies.

Steelworks Map Proves Popular

THE big demand for copies of its color map showing blast furnace and steelworks locations in the United States, together with capacity and names of the owners, proved an eye-opener to Commerce Department officials.

When the map was offered for public distribution on July 13, 6000 copies were in stock. All except a few hundred have been disposed of.



DISCUSS INFLATION: Action in the credit field alone will not solve the inflation problem, Federal Reserve Board Chairman Thomas B. McCabe, left, told the Senate Banking & Currency Committee before Congress passed credit control legislation recently. Here Mr. McCabe confers with Charles W. Tobey (Rep., N. H.), chairman of that committee. NEA photo

Elliot S. Hanson, chief of the Iron & Steel Division, Office of Domestic Commerce, has expressed the hope that at some time in the future a similar map showing rolling mill facilities by product, ownership and capacity can be made available.

Coking Coal Survey Under Way

DUE to a shortage in coking coals the Bureau of Mines is making a nationwide survey of mineable coking coals to serve as a guide in developing adequate reserves for use in times of national emergency. Beginning in sections of Pennsylvania, West Virginia, Kentucky, Tennessee and Alabama, the survey will extend to every coal-producing state.

Assisting the bureau in the survey is the Coal Resources Committee of the National Bituminous Coal Advisory Council. This committee is also working jointly with the bureau in the companion program to extend the supply of coking coals through washing and blending studies. Simultaneously, the Bureau of Mines will step up its research in blending coals and up-grading submarginal coals to augment the coking coal supply, and expand its investigations of coal reserves in Alaska.

Making Studies—While the coking coal survey proceeds, the bureau, in pilot plants and laboratories in Pittsburgh, and other stations, will study ways to remove sulphur and other impurities from coal which otherwise could be used for making coke. They will also study the blending of highly expanding coals with other coking coal to make blends safe for use in coke ovens. Submarginal, or low-grade coals will be blended with other coals to produce metallurgical-grade coal, and the highly expanding and submarginal coals will be added to the final coking coal estimates.

Another Strong Man Leaves

ANOTHER "strong man" has just left the Commerce Department. He is Rudolph Matthes who, since leaving the Navy in 1945, has been acting chief of the Industry Division of the Office of Domestic Commerce. In this capacity, he played an important role in keeping Congress informed of the department's activities. Mr. Matthes has gone with W. R. Grace & Co., New York, as assistant vice president.

German Steel May Reunite

Divorced units may be brought together to help restore minimum of domestic equilibrium

COMPROMISE on the knotty problem of steel plant integration in Germany seems likely. Many observers believe the divorced steel units must be brought together again in an attempt to restore at least a minimum of domestic economic equilibrium.

Even many Allied custodians of the newly formed non-integrated steel plants now concede that operations are economically and technically unsound; the American Steel Commission, drafting a report on the situation in the Ruhr, is expected to reach similar conclusions. Opposed to this view, however, is the opinion still held by many Allied factions and also by German trade unions that a steel monopoly must be prevented whatever the costs. Those favoring unit integration point out that the major obstacle to free competition is not a possible steel monopoly, but rather the economic climate of state-directed enterprise in which business has lived under the Nazis and since the war. If the non-integrated system is kept, they argue, permanent state support will result.

Foreign Capital Needed—Report by the American Commission is also expected to include comments on the steel industry's overwhelming need for foreign capital for rehabilitation. Foreign loans would be out of the question under present operating inefficiencies, although ERP credits, to be administered under a German RFC arrangement, should help toward rehabilitation.

Steel production is laboriously improving. Estimated output for the first half of the year is: 2,027,680 metric tons of steel ingots and castings compared with 1,645,000 tons during the same period of 1947; 1,788,000 tons of pig iron, in contrast to 1,207,000 tons a year earlier. Production of ingots and castings during June was the best since the war, with 377,748 tons turned out, compared with 323,545 tons in May. For pig iron, the record figures were 336,056 tons and 315,530 tons respectively, and for rolled products, 253,204 tons and 211,934 tons.

Currency Reform Benefits—The currency reform is generally credited for the improved June performance. Markets, however, are still in a turmoil, and some observers predict an inflationary spiral will burst from the confusion. Coal price rise of 7.50 marks per ton, just announced, will increase steel costs by 11.25 marks for ingots and 19.25 marks for steel bars. Higher electricity prices will further increase steel costs, with sheets, for example, boosted by 11 marks.

Industry, nevertheless, is picking up. The textile industry is placing large machinery orders, and the former Thyssen firm has received a $1 million contract to install a new coal mine shaft for Houilleres du Bassin de Lorraine, France, first order of this type obtained since the war.

Great Britain

MAJOR political battle looms over British iron and steel nationalization. The main round has not started, but in the preliminary skirmishes the government has taken the initiative with its proposals on how it will operate the industry should nationalization occur. A central board, which would probably be called a corporation, would be set up with very wide powers. All the main activities of the industry would be nationalized, down to the rerolling process. Individual firms would retain their identities and names and would be given much independence in their day-to-day working, although they would be bound by the main directives of the central board.

Possibly to arm itself with ammunition for such a fight, the government has also published figures showing the British domestic finished iron and steel prices are lower than American in all but a few cases. The inference is that such prices are kept at current levels only through government control. Pig iron prices have risen 102 per cent since prewar. Coke has gone up 185 per cent. Freight rates for iron ore have jumped 100 per cent.

France

FRENCH steel industry, already showing reassuring signs of recovery, will get another shot in the arm within the next five or six months with the blowing in of two additional blast furnaces in the Saar, now part of the French economic system. The prewar output of these two units accounted for 25 per cent of the whole Saar production, and about 3 per cent of total German output.

The amalgamation of two northern French steel firms, Societe des Fourneaux and Societe des Forges et Acieries du Nord et de L'Est, is also expected to be beneficial productionwise. New firm will have a capital of $55,500,000 and is installing a complete strip mill. Several companies are producing more steel now than ever before in their history, and most others are close to prewar rates or comfortably exceed figures for 1946 and 1947.

Belgium, Luxemburg

BENELUX steel exports are leveling off, and even slight price concessions are being offered for merchant bars for export. Steel production will soon be increased with the blowing in of a new blast furnace for the Cockerill firm in Belgium. The facility has a capacity of 600 tons of pig iron per day.

Czechoslovakia

CZECHOSLOVAKIAN exports of iron, steel and engineering products are about twice as high as in 1939. Nation's production of pig iron during the first five months of this year was 679,825 metric tons, compared with 578,000 tons in the corresponding period of 1947. For steel ingots and castings the output in the five months of 1948 was 1,134,647 tons, compared with 955,000 tons.

Austria

MINISTRY of Economic Planning has drawn up a scheme for expanded production of iron and steel in Austria. Output of raw steel is to be boosted to 1,070,000 metric tons, compared with the 650,000 tons turned out in 1937. Increased use of electric furnaces is contemplated to conserve scarce coal. Iron ore output, expected to reach 2,100,000 tons at Austria's Ergberg mines, should be adequate. The eventual demand for plates and sheets is estimated to reach 200,000 tons per year; an increase in production of welded tubes is anticipated, the present capacity being around 10,000 tons annually. Current production of 80,000 tons of wire products per year is expected to be sufficient.

Output of pig iron in Austria in the first four months of 1948 was 175,000 metric tons, as against 26,000 tons in the corresponding period of 1947.

Italy

PRODUCTION of Italian private automobiles is increasing, but the output of commercials is receding. In the first quarter of 1948, 9676 private cars were made, compared with 3349 in the first quarter of 1947. For commercial vehicles of all descriptions, the figures were 3666 for the first quarter of this year, as against 4150 in the first three months of 1947.

Mill Pricing Pains

Youngstown area may not have them, but is considering remedies just in case

YOUNGSTOWN, one of the "steeliest of the steel districts," is in a quandary over what the shift from the basing point to the f.o.b. mill pricing system is going to do to it.

Some Youngstowners are pessimistic about the outlook for the future. Still others feel the change is going to give the area's new industrial development campaign quite a lift.

The district ranks fourth as a steel producing area, but it is smallest, geographically, of any major sector, and a larger percentage of its population depends directly on steel than does any other large steel producing area.

Campaign Started—To counteract the adverse effects of the shift, Youngstown Sheet & Tube Co. has just set up an Industrial Development Division to try to attract steel consumers to the district. It is headed by the promotion manager, Myron S. Curtis.

"While we are still convinced that it is best for consumers of steel and the nation as a whole. . . " said President Frank Purnell, in commenting on the appointment, "that Congress take action to correct in a proper way the effect of the Supreme Court decision, we want at the same time to offer any assistance possible to those who may show interest in establishing producing facilities in the Youngstown area."

The change in the pricing system hasn't made some steel consumers in Youngstown too unhappy, although some get a price increase in addition to the recent boost in steel prices. One fabricator points out that competitors located far from steel mills heretofore have had the advantage over local manufacturers, in that they have had cheaper wage rates, also steel as cheaply as did those within the shadow of the steel mills. "Now this evens the score," this fabricator says. "We still will have to pay our labor more money than do our principal competitors, but we will get steel cheaper than they."

Reshuffle Buying Programs—Some companies now are reshuffling their purchasing programs. A large consumer in Youngstown, for example, buying from Pittsburgh, finds that his sheet now costs $4 a ton more than it would if obtained at home. Company is trying to divert its orders. Another local user had bought much of its steel from Armco Steel Corp. in Middletown, O., but is trying to work out arrangements to get it all locally. Still another firm has been buying plates from Carnegie-Illinois Steel Corp. at Homestead and stainless steel where it could locate it. Considerations of competition force this company now to buy much of its steel in nearby markets—or not at all.

Norris J. Clarke, vice president of Republic Steel Corp., recently told a group of Youngstown fabricators that the area wouldn't suffer much from the shift. He explained that pipe mills, for example, are all located considerable distances from the consuming markets, and that all would probably share equally in the business, with consumers paying the freight. Enough users of other steel products, he added, are located reasonably near the Youngstown mills to consume all other products made in the district.

MILL PRICING CREATES PROBLEM FOR YOUNGSTOWN STEEL MILLS

Pittsburgh Fabricators May Boom

IN THE WAKE of the steel industry's shift to mill pricing has come a flood of inquiries regarding production time available with fabricators engaged in contracting work in the Pittsburgh and Youngstown area.

Manufacturers who normally subcontract work on some of the parts for their finished products have made many recent contacts with fabricators that have benefited from the pricing change and now find themselves in a favorable geographical position for freight rates. Typical of the firms receiving such inquiries is Ohio Valley Steel Sales Co., which a short time ago completed a $250,000 plant at Steubenville, O. Because of new fabricating demands, Ohio Valley is now accepting schedules for additional open facility time for the third and fourth quarters of 1948 on its heavy capacity equipment.

Cement Institute Case Analyzed

THE general counsel's office of the Chamber of Commerce of the United States has completed preparation of an analysis of the apparent implications of the Supreme Court's decision in the Cement Institute case involving the so-called "basing point delivered price system." Copies may be had by writing the Chamber's Washington headquarters.

River Plan To Ease Coal Shipment

METALLURGICAL coal supplies for Pittsburgh district steel mills may be insured for "decades" following completion of federal navigation projects on the upper Monongahela river.

Initial congressional appropriation of $3 million will permit work to start, probably in late December, on the first unit in the program, the new Morgantown lock and dam. This will be the first of a series of three new locks and dams that will open the Monongahela to heavy traffic from Pittsburgh to about a mile above Fairmont, W. Va. The entire program will cost an estimated $24 million and should be completed in six to eight years.

Although the first unit, the Morgantown project, will not be finished for two and a half years, steel companies already are preparing for the rush in coal shipments by barge. Weirton Steel Co. is reported opening a new coal mine at Little Falls,

W. Va., and Carnegie-Illinois Steel Corp. is said to be considering new loading docks at Fairmont and Hildebrand as soon as the river becomes fully navigable that far. Company has mines at both places that aren't being worked because of transportation. Pittsburgh Consolidation Coal Co. is completing extensive improvements at its Arkwright mine near Morgantown. Other Pittsburgh properties, including loading docks which had been abandoned, are being whipped into shape.

One geological survey has estimated that 1.6 billion tons of coal of metallurgical grade are still in the ground above Morgantown. Supplies of this quality coal in the Pittsburgh area are nearing exhaustion.

Meetings . .

Aug. 24-27, American Institute of Electrical Engineers: Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

Aug. 30-Sept. 3, American Chemical Society: Eastern section of annual meeting, Washington, D. C. Society headquarters are at 60 E. 42nd St., New York.

Sept. 6-10, American Chemical Society: Midwest section of annual meeting, St. Louis. Society headquarters are at 60 E. 42nd St., New York.

Sept. 7-9, Society of Automotive Engineers: National tractor and diesel engine meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 7-10, American Society of Mechanical Engineers: Fall meeting on hydroelectric resources and wood industries of Pacific Northwest, at Portland, Oreg. Society headquarters are at 29 W. 39th St., New York.

Sept. 9-10, American Ceramic Society: Fall meeting, Hotel Conneaut, Conneaut Lake Park, Pa. Society headquarters are at 2525 N. High St., Columbus, O.

Sept. 13-17, American Chemical Society: Western section of annual meeting, Portland, Oreg. Society headquarters are at 60 E. 42nd St., New York.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Sept. 20-25, American Mining Congress: Metal mining convention and exposition, San Francisco. Congress headquarters are in the Ring Bldg., Washington.

Sept. 23, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh.

Sept. 27-Oct. 2, Society of the Plastics Industry: Third national plastics exposition, Grand Central Palace, New York. Society headquarters are at 295 Madison Ave., New York.

Sept. 28-Oct. 30, Porcelain Enamel Institute: Institute is one of sponsors of first international congress on porcelain enameling, London. Institute headquarters are at 1010 Vermont Ave., N.W., Washington.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention and exhibition, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland.

Oct. 1-2, Southern Ohio Section of Open Hearth Committee, Iron & Steel Division and Ohio Valley Section, AIME: Annual fall meeting, Deshler-Wallick Hotel, Columbus, O.

Oct. 4-7, Industrial Packaging Engineers Association and University of Illinois: First annual industrial packaging and materials handling short course, Sherman Hotel, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 4-11, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.

Oct. 5-7, Industrial Packaging Engineers Association: Show at Hotel Sherman, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 5-7, American Institute of Electrical Engineers: Middle eastern district meeting, Washington. Institute headquarters are at 33 W. 39th St., New York.

Oct. 5-7, Materials Handling Institute: Regional materials handling exposition, Mechanics Hall, Boston. Institute secretary-treasurer is R. Kennedy Hanson, 1108 Clark Bldg., Pittsburgh.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Hotel Stevens, Chicago.

Oct. 11-13, American Society of Tool Engineers: Semi-annual convention, Biltmore Hotel, Los Angeles. Society executive secretary is Harry E. Conrad, 1666 Penobscot Bldg., Detroit.

Oct. 11-13, National Lubricating Grease Institute: 16th annual convention, Edgewater Beach Hotel, Chicago. Institute headquarters are at 4638 Mill Creek Parkway, Kansas City, Mo.

Facts for Industry . . .

Warm Air Furnaces

Factory shipments of 55,000 warm air furnaces in May, valued at $9.3 million, continued the upward trend that began in March. Shipments represented an increase of 22 per cent over the 46,000 units shipped in May, 1947. Inventory of warm air furnaces at the end of May was 107,000 units which represents a slight decrease from stocks at end of April. During first 5 months of this year, 223,000 warm air furnaces were shipped compared with 316,000 units for same period in 1947. *Census Bureau, Commerce Dept.*

Water Heaters

Shipments of water heaters, except electric, during May dropped to 161,000 units valued at $7.2 million, representing a decrease of 7 per cent from the April figure and a decrease of 23 per cent from the number of units shipped in May, 1947. Inventories at the end of May declined to 132,000 units from 135,000 at the end of previous month. Direct-fired water heaters accounted for 93 per cent of the total, amounting to 149,000 units which is a drop of 9 per cent from the figure of the previous month. During the first 5 months of this year 844,000 units were shipped, representing a decrease of 35 per cent from shipments for the same period in 1947. Shipments of electric water heaters in May rose slightly to 61,435 units compared with April shipments of 58,923 units. Range boiler shipments of 41,000 units in May dropped 21 per cent from the April figure. *Census Bureau, Commerce Dept.*

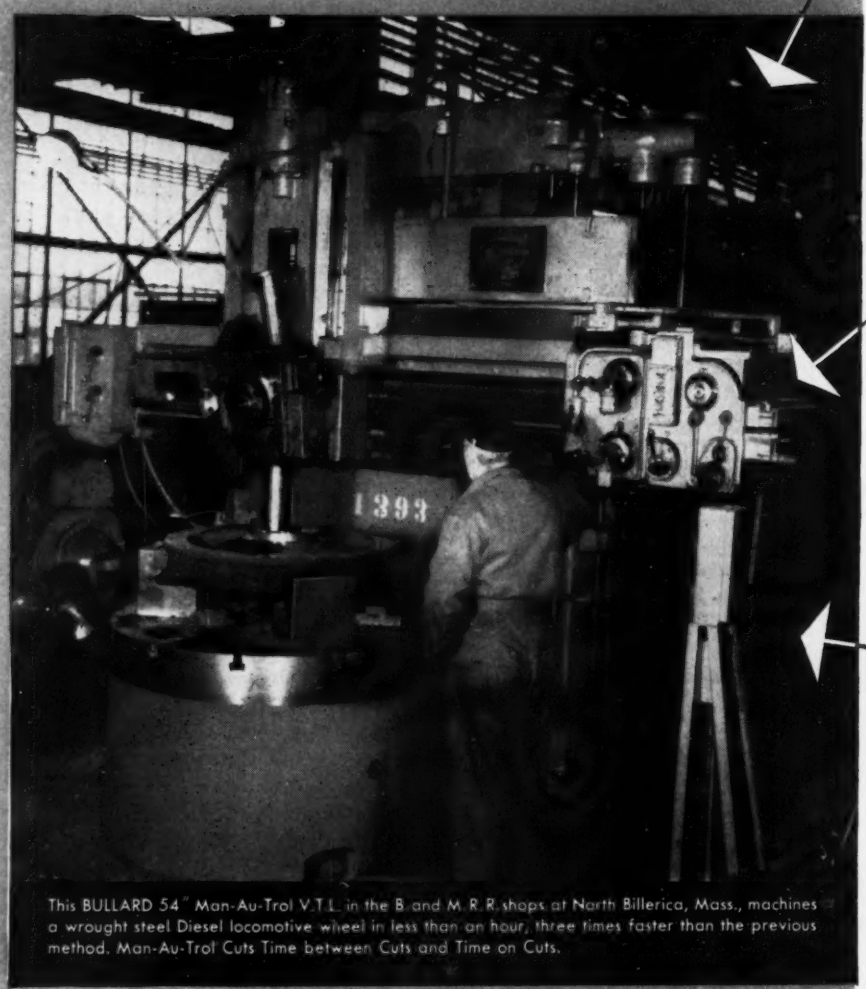
Rubber

Total rubber consumption in June was 95,010 long tons compared with 87,290 tons in May and 85,109 tons in June, 1947. It marked the first time this year that monthly rubber consumption exceeded that of the corresponding month in 1947. Of the total June figure, consumption of natural rubber was 55,692 tons, including 2278 tons of latex, a postwar high. Synthetic rubber consumption at 39,318 tons was the highest since January. Imports of natural rubber amounted to 64,055 tons (including 2288 tons of latex) and exceeded consumption for the first time since March, halting the recent sharp downtrend in stocks. *Domestic Commerce Office, Commerce Dept.*

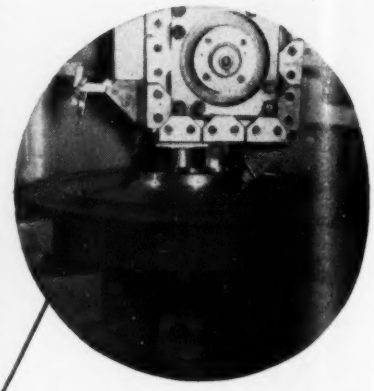
Petroleum

Amount of domestic crude petroleum to be consumed or exported in August, 1948, is estimated at 5,660,000 bbl daily. Forecast includes estimates of total gasoline demand of 86 million barrels, total crude runs to stills of 5.7 million bbl daily and a gasoline yield from crude of 41.2 per cent. Based on actual April and May figures and estimates for June, total stocks of refined oils are estimated at about 284 million bbl on June 30, an unusual gain of almost 32 million bbl during second quarter. Principal changes are estimated as a drop of 8 million bbl in finished gasoline stocks and increases of 15 million bbl in distillate fuel oil stocks, 11 million bbl in residual fuel oil stocks and over 8 million bbl in kerosene stocks. These increases are in line with forecast of necessity for a substantial gain in refined stocks during the year to insure an adequate supply of fuel oil for next winter. *Bureau of Mines, Interior Dept.*

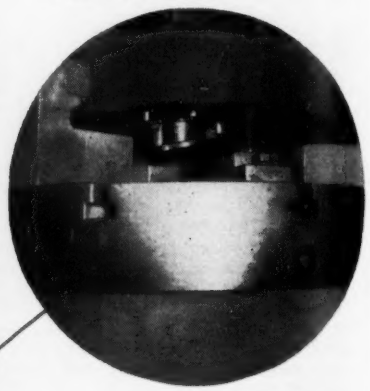
BULLARD MAN-AU-TROL V. T. L. AUTOMATICALLY MACHINES DIESEL WHEELS 3 TIMES FASTER



This BULLARD 54" Man-Au-Trol V.T.L. in the B. and M. R. R. shops at North Billerica, Mass., machines a wrought steel Diesel locomotive wheel in less than an hour, three times faster than the previous method. Man-Au-Trol Cuts Time between Cuts and Time on Cuts.



Here the boring tool and turning cutter on B. and M.'s Man-Au-Trol V.T.L. have nearly finished their cuts. When finished, the head moves to the right to straddle face the hub.



View from underside of wheel showing boring tool at end of cut, ready to move to the right to take straddle cut. Note lower straddle cutter on right side of bar.

Here you see the finish of the hub straddle facing operation. Now the head and bar move left to center of bore and rise to index position for next operation.

Your investigation of BULLARD Man-Au-Trol for your work will convince you that its combination of versatility, accuracy, productivity, cost-cutting ability is hard to beat. Write for Bulletin MAV-G-1, today, THE BULLARD COMPANY, Bridgeport 2, Connecticut.

BULLARD MAN-AU-TROL — MASTER OF THE MACHINE

BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Upheaval in steel pricing likely to wash out quality and service as deciding factors in selling materials and parts to automotive industry

DETROIT

QUALITY and service appear likely to be washed out as deciding factors in selling materials and parts to the automotive industry in the wake of an upheaval in prices the like of which has never been seen.

Touched off by the steel industry's adoption of f.o.b. mill quotations, which mean virtually separate price cards for every producing plant in the country, the price nightmare is further complicated by steadily mounting freight tariffs and the necessity of steel consumers paying the full freight bill from mill sources.

Naturally, the impact of the sudden change has affected parts suppliers to the same extent, possibly more, than it did manufacturers of passenger cars and trucks. Many parts sources currently are burning the midnight oil in the attempt to reconcile new steel costs with what they must charge for their finished products. At the moment it appears that in the parts field, as well as in the steel business, there are likely to be about as many different prices quoted as there are companies quoting them.

Radical Change—Since the days of the NRA codes, 15 years ago, prices generally have been what might be termed stagnant as far as competitive suppliers to the motor industry were concerned. True, there were minor variations which permitted a purchasing agent some area of choice in selecting a supplier, but more often quality of the product, quick delivery, special service features and the like were motivating forces behind sales.

This is all changing, whether for the long term or not remains to be seen. F.o.b. pricing of steel, on the face of it, means that geographical proximity to the user will be the chief clincher of a sale. Many view the turn as a sort of socialization of industry, destruction of the incentive to compete on the basis of the true worth of the product, and localization of sales territories. It is too early to judge how sound these viewpoints may be.

Detroit is Magnet—There is one important thing to keep in mind: Detroit, as always is the powerful magnet in the industrial market place. Wherever a supplier may be, when he is setting new prices he keeps one eye on Detroit and its volume buyers in the automotive field. He wants to try to stay competitive there and, as a consequence, will be inclined to set prices at such a level that the delivered price in Detroit will be on a par with competitors.

Two alternatives are faced—either the f.o.b. price is so low that profit margins are sacrificed, or some form of transportation must be lined up, enough below present rail rates on long hauls to avoid an excessive freight load on the price.

The latter route, or a slight variation of it, was the first step taken by Carnegie-Illinois Steel when it asked railroads to consider a 40 per cent reduction in tariffs on Pittsburgh-Detroit shipments. Buffalo and Chicago mills have the possibilities of the low-cost water routes to Detroit and Saginaw to consider. Not being overlooked is the feasibility of organizing expanded trucking lines to move steel to the motor plants from distant mills. On the later score are problems of ensnarling and conflicting state regulations governing movement of heavy trucks needed to haul steel, not to mention suitable loading facilities for trucks at steel plants.

Assessed Double—Local fabricators obtaining steel from mills in this area and paying only the local rail switching charge for delivery are complaining that they are being assessed a "double switch" where tonnage has to move over two rail lines, whereas formerly they paid only the standard switching rate. There is talk of groups of steel users banding together to organize their own trucking company to handle the co-operative delivery of mill products, and discontinue rail shipments. They argue that cost savings would be possible and quicker deliveries effected.

As yet there have been no major changes mapped out by automotive companies on materials or parts sources. Immediate concern is simply over obtaining releases when needed, price still being incidental. Perhaps it could be stated that prices are becoming a little less incidental then they were three months ago. Purchasing departments, particularly those of the larger companies, are carefully assembling freight data and are pressing suppliers for details of latest revision in price sheets

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,133	443,588
April	462,315	445,137
May	359,989	404,191
June	454,388	421,466
6 mos.	2,617,609	2,474,223
July	489,346	400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
July 24	118,797	83,867
July 31	113,706	97,712
Aug. 7	110,313	79,452
Aug. 14	95,000	83,501

Estimates by Ward's Automotive Reports

Ford Building New Slag Plant

OPEN-HEARTH slag and skull cracker building costing $500,000 is now going up at the Ford Rouge plant, to be ready by the end of November. The 555-ft building will be in two sections and will be 175 ft long, 90 ft wide and 104 ft high in the portion handling ladle skulls, while the slag section will be 380 ft long, 90 ft wide and 90 ft high. In the skull cracker section, a 40-ton overhead crane will lift a 15-ton ball 90 ft into the air and let it fall on skulls weighing, in some cases, more than 20 tons. Previously these agglomerates were cut up by acetylene torch and the new method will replace torch cutting to a large extent.

Slag Department—The slag department will house a pit 350 ft long, 56 ft wide and 10 ft deep, into which

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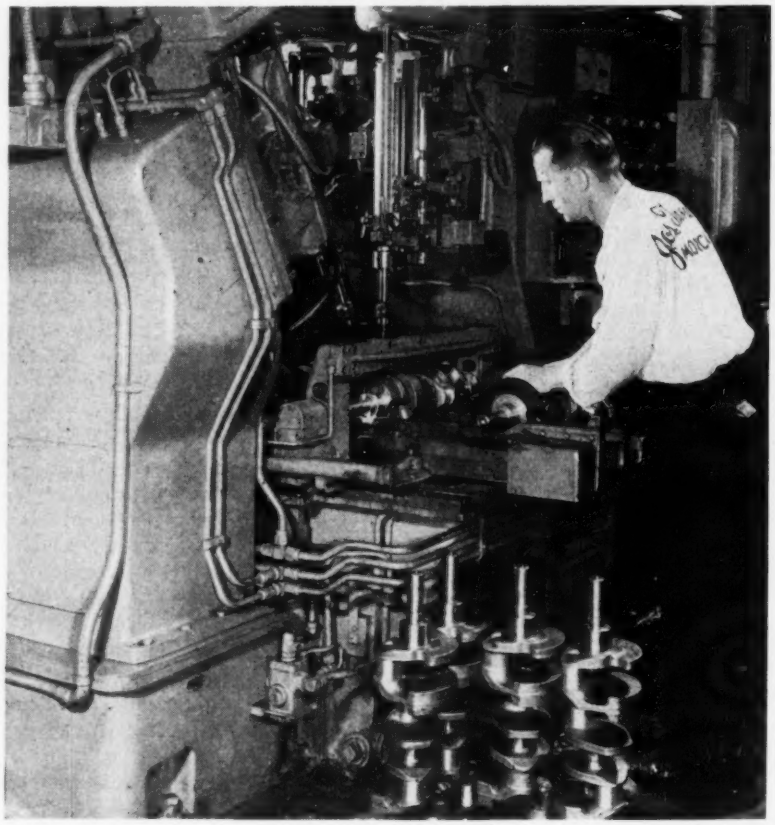

THE EASY WAY: To speed production, Ford Motor Co. has introduced a progressive transfer-type machine for drilling oil holes in steel V-8 engine crankshafts for 1949 Ford and Mercury passenger cars. New method requires only the loading of crankshafts onto the transfer conveyor at one-end of the machine, rest of the operations being automatic until crankshafts are unloaded at end of the 39-foot long machine. The machine drills and deep-drills 12 oil holes and drills and reams four Welch plug holes in each crankshaft

will be poured molten open-hearth slag. The latter will be sprayed with water, breaking into small pieces. An operator, controlling the flow of water, will be enclosed in a small steel-plate cupola to protect him against hot slag splashing and explosions. After being cooled, the broken slag will be transfered to railroad cars by means of two 20-ton cranes with buckets. Material will be sold for road ballast. Because of the operations performed in the building, walls will be ⅜ in. steel plate for the first 30 ft, then ¼ in. plate for the next 30 ft, and 10-gage steel mesh for the remainder. Roof will be corrugated steel.

New Shipping Docks at Rouge

WORK also has started at the Rouge plant on new shipping and receiving docks for the pressed steel, parts and accessories and manufacturing services building. The docks, planned to expedite truck handling facilities, will be of steel, and concrete and masonry construction and will be equipped with elevating dock plates to compensate for height differences between dock and truck floors. When completed the docks at the pressed steel building will accommodate 65 trucks carrying 950 tons of material daily. Parts and accessories docks will handle 155 trucks carrying 465 tons of parts daily, and the manufacturing services building docks will handle 191 trucks carrying 730 tons of materials daily. Project will be completed next month.

Employee Suggestions Pour In

EMPLOYEE suggestions continue to pour in to the headquarters of various departments at Ford which have instituted payoffs for workable ideas. A job setter in the foundry machine shop was awarded $1500 for a suggestion providing for the use of a limit switch and the extension of the locking pin on a camshaft and crankshaft lathe. Damage to cutters, machine heads and cylinder blocks in process resulting from improper insertion of locking pins has been eliminated by the use of the limit switch.

An employee in the production foundry received the same amount for suggesting that oil holes in cylinder blocks be cleaned with a power reamer instead of by hand.

A relief first helper in the open-hearth department was paid $692 for proposing an improved type of slag flush runner for furnaces, with larger area and lined with brick. In case of a hole in the runner, a plate can be used over the hole and a new brick lining inserted. The shell outlasts the former type of runner and permits a faster flush because it is deeper.

A crane operator clicked for $300 with the suggestion that wood linings of pickling tanks be assembled with bronze bolts and nuts to hold aluminum bronze angle plates in position, instead of the former screws which dropped out when the wood lining became eroded.

Fighting River Pollution

CHEVROLET is spending about $300,000 on equipment to help end pollution of the Flint river resulting from oily wastes originating in its motor manufacturing plant there. A separate building is being constructed to house the new equipment. Research work is under way to develop a system for eliminating added pollution of the river caused by cyanide wastes from plating plants in the area. Chemists are seeking to develop a practical method of absorbing cyanide from rinse water used in plating tanks, which would eliminate pollution and also permit reuse of the rinse water. David Milne, chemical engineer in the production engineering section of General Motors, has been taking an active part in these efforts which include the Buick and AC Spark Plug Division of General Motors in Flint as well.

Chrysler Earnings Reflect Strike

NET earnings of Chrysler Corp. for the first six months of the year were nearly $28.5 million, or 4.29 per cent on sales as compared with $35 million or 5.41 per cent on sales for the same period of 1947, reflecting the impact of the 17-day strike in the company's plants and frequent interruptions resulting from materials shortages. Unit sales, for example, were 439,159 cars and trucks, against 460,252 in 1947. Dollar sales, however, were up a little better than $14 million by virtue of higher prices.

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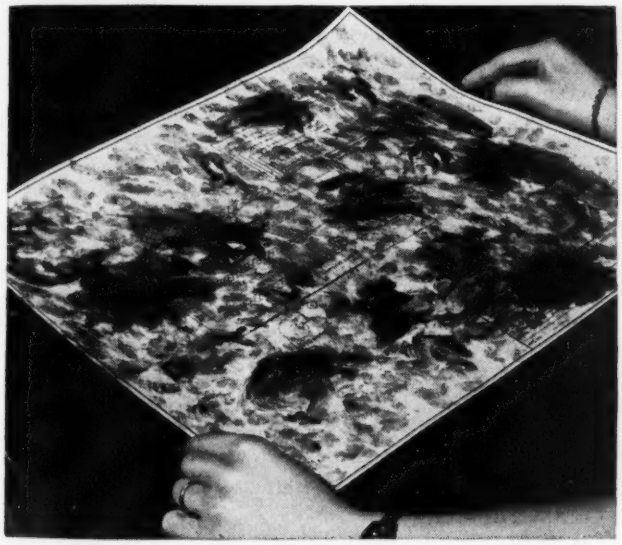

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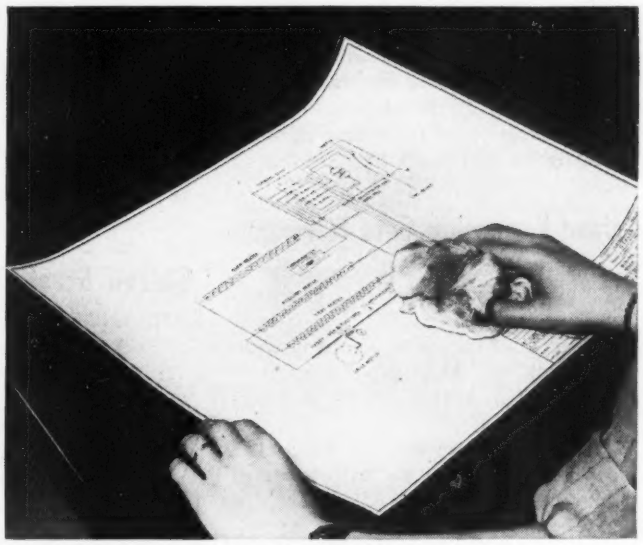

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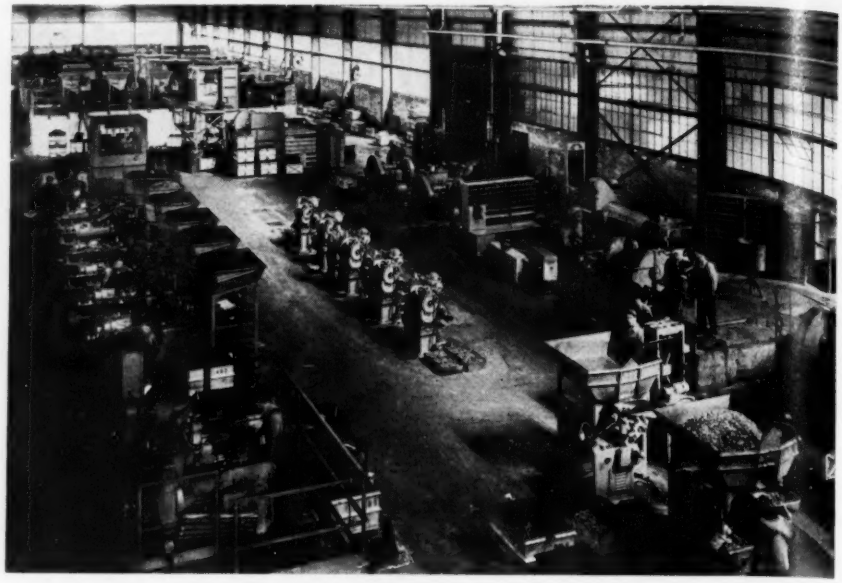
New Plant for Fasteners

Bethlehem Pacific's new Seattle unit may ease supply situation in bolts and nuts

TIGHT supply situation in the fastener field may be loosened slightly with the opening of a new nut and bolt plant in Seattle by Bethlehem Pacific Coast Steel Corp., a Bethlehem Steel Co. subsidiary. The Seattle unit, completed at a cost of $500,000, will produce approximately 10,000 tons annually and will boost Bethlehem Pacific's total bolt and nut output to 30,000 tons per year.

The new factory adjoins the old steelmaking plant of Pacific Coast Forge Co., acquired by Bethlehem in 1945. Production is completely integrated from steelmaking to packaging of bolt and nut products. Equipment installed or on order for the new unit includes heading, threading, nut-making and tapping machinery. Production line technique in producing both hot-forged and cold formed bolt and nut items is followed. Die and moving parts for the machines are produced and serviced in the new plant's machine shop.

Seattle facilities have been designed for production of some specialty items. These include silo rods, wooden pipe bands, foundation bolts, special agricultural machinery bolts, salmon trap staples, railroad specialties and plywood bolts. Bethlehem Pacific also manufactures bolts and nuts at Los Angeles and South San Francisco.



NEW BETHLEHEM BOLT AND NUT UNIT IN SEATTLE MAY CUT SUPPLY SNARL

Inland Expansion Gets Financing

ARRANGEMENTS have been completed by Inland Steel Co., Chicago, for loan of $20 million which will be used to finance a company-wide modernization and expansion program, part of which is now in progress.

The major projects for which the proceeds of this loan will be used include: Construction of a new ore boat now contracted for with American Ship Building Co., Cleveland; construction of a battery of 65 coke ovens; expansion of the cold strip mill and tinning plant operations; renovation and rebuilding of part of the No. 2 open hearth building; and construction of a new coal preparation plant in connection with a new mine which is to be opened.

Harvester Builds St. Paul Depot

INTERNATIONAL Harvester Co.'s partial remedy for the problem of distribution is a chain of parts depots thoughout the United States, third unit of which will be constructed at St. Paul.

The $1 million facility will be built adjoining the present Harvester building at Franklin and Eustis streets, and will be part of an eventual network of 11 such depots throughout the nation. This unit will serve as a wholesale distribution center for branches and retail dealers in Minnesota, North and South Dakota, northwestern Wisconsin and northern Iowa.

The depot will be of one story construction and will contain a total area of about 250,000 sq ft. A mechanical conveyor system will be installed to facilitate handling of parts in large volume. Customer service will start in the fall of 1949.

Sharon Steel Buys Coal Mine

ARRANGEMENTS for the purchase of Rachel Mine located near Fairmont, W. Va., from Jamison Coal & Coke Co., have been completed by Sharon Steel Corp., Sharon, Pa. Repair work is proceeding on the shaft which had partially caved in during September, 1947, and will be finished late this year.

British Firm Buys U. S. Exporter

CONTROLLING interest in American M.O.T. Inc., New York, steel exporting firm, has been acquired by Messrs. Derby & Co. Ltd., London, England. Name of the American company has been changed to Derby & Co. Inc. The new majority stockholder has been a merchant firm for more than 150 years, specializing in minerals, precious metals and kindred products, with offices in Australia and South Africa.

The New York company, in addition to exporting steel, will now import minerals and ores.

Chrysler Shifts Indiana Output

CHRYSLER will began production of station wagon bodies in October at its Evansville, Ind., assembly plant. Part of the facility will still be used for assembly of Plymouths.

Chief reasons for this shift are: Sheet steel shortage is forcing Chrysler to place more emphasis on wooden station wagon bodies; Plymouth assemblies at Evansville have not been at the rate originally contemplated; and Hercules Body Co. of Evansville has gone out of business and Chrysler can absorb many of this manufacturer's employees.

Hercules is quitting business, according to its president, George K. Specht, because it is too far from Detroit to produce at a profit.

U.S. Patent Applications Fall

HINT of future technological trends in the United States is indicated by the decline of 15 per cent in United States patent applications since 1930.

Machinery & Allied Products Institute, which has made a study of this situation, points to similar circumstances in Great Britain where a leveling off of patent applications about 1910 paralleled the technological stagnation of that country.

The all-time high in patent applications in the United States, says the institute report, was reached in 1929, with 94,738. During the depression there was a decline of almost 40 per cent. Not until 1946 did applications approach the 1929 figure, and then, strangely, they began to decline.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Allmon Steel Co. has been formed as a sales firm for specialty steels with offices in the Arrott Bldg., Pittsburgh, and in Washington. Executive staff, formerly associated with Jessop Steel Co., consists of Fred T. H. Youngman, president, T. W. Pennington, executive vice president and treasurer, and R. A. Parks, general manager of sales.

—o—

John S. Barnes Corp., Rockford, Ill., manufacturer of hydraulic structures, pumps, controls and fluid power units, has appointed Nielsen Hydraulic Equipment Inc., New York, as its sales representative for eastern New York state and metropolitan New York.

—o—

Ohio River Co., Cincinnati, has ordered 10 welded steel coal barges from Dravo Corp., Pittsburgh. Each barge will be 175 ft by 26 ft by 11 ft.

—o—

Servel Inc., Evansville, Ind., has manufactured its 3 millionth gas refrigerator since it began making the units in 1926.

—o—

American Washer & Ironer Manufacturers' Association, Chicago, reports that 386,685 standard-size household washers were sold in June, fourth best month in history. The alltime record was established last March, with 398,298 units sold.

—o—

Department of Commerce will drop its allocations system for overseas export of United States coal Sept. 1. Allocations, which have been in operation since 1944, will be abandoned because of improved coal production.

—o—

White Metal Mfg. Co., Hoboken, N. J., manufacturer of metal can spouts and collapsible tubes for industrial and other products, has appointed H. W. Clowe & Co., Jackson, Miss., as its representative in Alabama, Arkansas, Louisiana and Mississippi.

—o—

Agricultural & Mechanical College of Texas, College Station, Tex., will offer its third short course on "Instrumentation for the Process Industries" Oct. 26-28. Course will be conducted as a seminar with lectures and discussions on automatic control.

—o—

Federal Drop Forge Co., Lansing, Mich., manufacturer of parts for automobiles and agricultural machinery, has revised its group insurance program whereby its employees receive life insurance and sickness and accident protection in addition to hospital and surgical operation coverage for both themselves and their dependents.

—o—

Sherwin-Williams Co., Cleveland, as the result of improved raw material supplies, has reinstated its complete line of Kem Lustral industrial enamels.

—o—

Amplex Division of Chrysler Corp., Detroit, has completed an expansion program at its Detroit plant for improved production of bearings and finished machine parts.

—o—

Inland Steel Co., Chicago, reports that its new ore boat under construction will be named "Wilfred Sykes" in honor of the company president.

—o—

Chicago Association of Commerce & Industry announces that industrial developments in the Chicago area, valued at $17,164,000, were set in motion during July, compared with $16,541,000 for July of last year. Totals for the first seven months of 1948, however, at $80,348,000, compare with $106,093,000 for a similar period in 1947.

—o—

Bureau of Mines will lend a large gas turbine, once destined for Russia under the lend-lease program, to the Locomotive Development Committee of Bituminous Coal Research Inc. for experimentation on the use of pulverized coal as a fuel for gas turbine locomotives.

—o—

Taylor Pipe & Forge Works, Chicago, has purchased from War Assets Administration a plant at Fontana, Calif., formerly occupied by Kaiser Co. Inc. Taylor will manufacture spiral pipe, 6 to 36 inches in diameter, at the facility which provides 207,000 sq ft of floor area.

—o—

Eastern Brass & Copper Co., New York, has completed a two-story addition to its present building at 1122 E. 180th St., and now has 50,000 sq ft for its warehousing activities in ferrous and nonferrous metals.

—o—

Solar Steel Corp., Cleveland, iron and steel distributor, with operations also in Detroit and Chicago, has established an office in the Bond Bldg., Washington, in charge of Nathan Siegel, to provide closer contact with government actions which may effect Solar's business.

—o—

Mathieson Chemical Corp., New York, has purchased an ammonia plant and ammonia oxidation facilities at Lake Charles, La., from War Assets Administration for $7,063,300. Mathieson had leased these units from the U. S. during and since the war.

—o—

Twin Coach Co., Kent, O., has resumed manufacture of trolley coaches. Firm began such production in 1927, but discontinued activity in this field in 1942 to convert facilities for war output.

—o—

Chain Belt Co., Milwaukee, manufacturer of conveying and power transmission chains, construction machinery and allied products, has opened a district sales office at 2900 W. Clay St., Richmond, Va. Fred W. Taylor will be district manager.

—o—

Glidden Co., Cleveland, manufacturer of industrial finishes and other products, has licensed Euston Lead Co. Ltd., Melbourne, Australia, to use the Euston process for the manufacture of white lead.

—o—

Schuck Mfg. Co. Inc., Los Angeles, maker of mechanicals toys, screw machine products, tools and other items, has purchased a nine-acre tract in Ontario, Calif., for eventual construction of a factory.

—o—

Economy Pumps Inc., Hamilton, O., manufacturer of centrifugal, axial flow and mixed flow pumps, has appointed Dinham Co., Minneapolis, as a distributor.

—o—

F. W. Berk & Co., New York, producer of mercury and mercurials, has begun manufacture of zirconium products for use in chemical, ceramic and metallurgical industries. Firm has begun output at its Wood Ridge, N. J., plant.

—o—

Ryan Aeronautical Co., San Diego, Calif., has received a $2,500,000 contract from the Air Force for 158 four-place Navion planes and component and spare parts.

—o—

Cutler-Hammer Inc., Milwaukee, has purchased West Electric Products Co., Los Angeles. West's plant will be integrated with other Cutler-Hammer units in the manufacture of motor control and allied electrical devices.

—o—

American Standards Association has become incorporated under the laws of the State of New York, as American Standards Association Inc.

The Business Trend

INDUSTRIAL production continued at near record levels for the third consecutive week although STEEL's industrial production index for the week ended Aug. 7 eased off to a preliminary 169 per cent of the 1936-1939 average.

Steel ingot output rose slightly to 94 per cent of capacity. Clouding the industrial picture, however, are continuing suppliers' strikes which threaten to put a serious crimp in automobile production.

AUTOMOBILES—Production figures continued to slip because of shortages in foundry-supplied components. Additional lines are expected to shut down as the principal automobile builders fall victims to shortages. Army Ordnance Department has asked truck manufacturers to submit bids on vehicle contracts totaling almost $22 million. Bulk of these contracts is for Jeeps and three-quarter ton trucks. Bids for larger vehicles will be asked for at a later date.

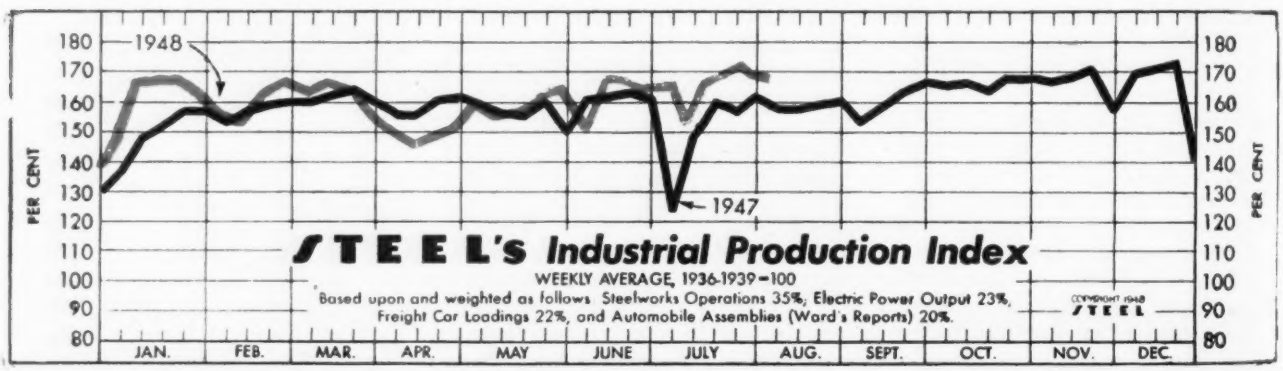
RAILROADS—Net railway operating income of the 132 class 1 railroads was $124,979,063 for June, more than double the amount reported for June, 1947. Estimated net income of the railroads after interest and rentals was $94 million in June compared with $44 million for the same month last year. Reduction in payroll taxes levied on railroads for unemployment and sick benefits accounted for about one-quarter of the increase and remaining three-quarters of the increase resulted from boosts in rates, passenger fares and mail pay authorized during past year.

FOREIGN TRADE—Exports during June, valued at $1,013,100,000, were 8 per cent below May while imports, aggregating $615,600,000, were 12 per cent higher. Gap between exports and imports was narrowed to $397,500,000 in June, lowest figure for many months, according to Commerce Department officials.

CONSTRUCTION—July returns on dollar value of new construction show it is keeping pace with the prediction of Commerce Department that $18 billion in building activity will make 1948 a record year. Record will be set in dollars spent, not in actual amount of construction done. Construction employment for July was 2,186,000 workers, higher than for any corresponding month since 1942. It was the fifth straight month of such increases.

WHOLESALE PRICES—Sharp advances for iron and steel products were nearly offset by lower prices for farm products and food, resulting in an increase of 0.1 per cent in primary market prices during week ended July 31 as reported by Bureau of Labor Statistics. At 168.3 per cent of the 1926 average, the index is 1 per cent above four weeks ago and 11.2 per cent above corresponding week of last year.

ELECTRIC POWER—Electric power distributed continues to increase as expansion of the nation's generating capacity continues. Weekly output for July topped 5 billion kilowatt hours with the exception of the week affected by the July 4 holiday. Federal Power Commission reports that generating capacity for the nation during period from 1947 to 1951 will be enlarged by 29 per cent.



Index (chart above): Week ended Aug. 7 (preliminary) 169 Previous Week 170 Month Ago 153 Year Ago 158

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	94.0	93.0	89.0	95.0
Electric Power Distributed (million kilowatt hours)	5,319	5,352	4,760	4,874
Bituminous Coal Production (daily av.—1000 tons)	2,068	2,020	578	1,925
Petroleum Production (daily av.—1000 bbl.)	5,505	5,455	5,480	5,104
Construction Volume (ENR—Unit $1,000,000)	$153.6	$114.3	$168.7	$109.8
Automobile and Truck Output (Ward's—number units)	110,313	113,270	98,700	79,452

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

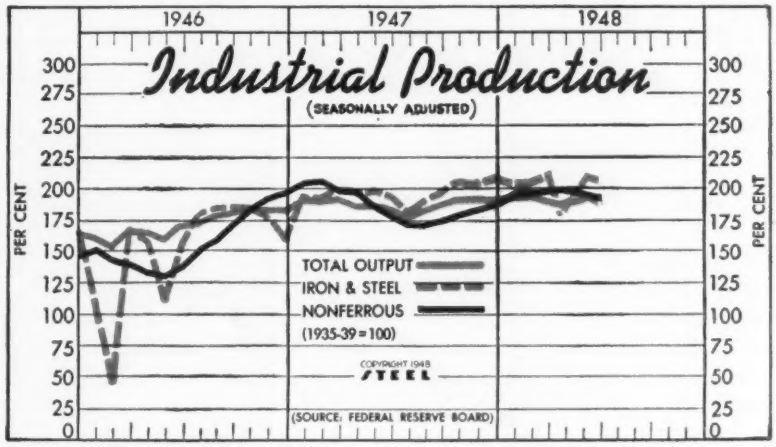
TRADE				
Freight Carloadings (unit—1000 cars)	898†	894	755	905
Business Failures (Dun & Bradstreet, number)	116	98	88	60
Money in Circulation (in millions of dollars)‡	$27,922	$27,821	$28,142	$28,206
Department Store Sales (changes from like wk. a yr. ago)‡	+7%	+8%	+28%	+1%

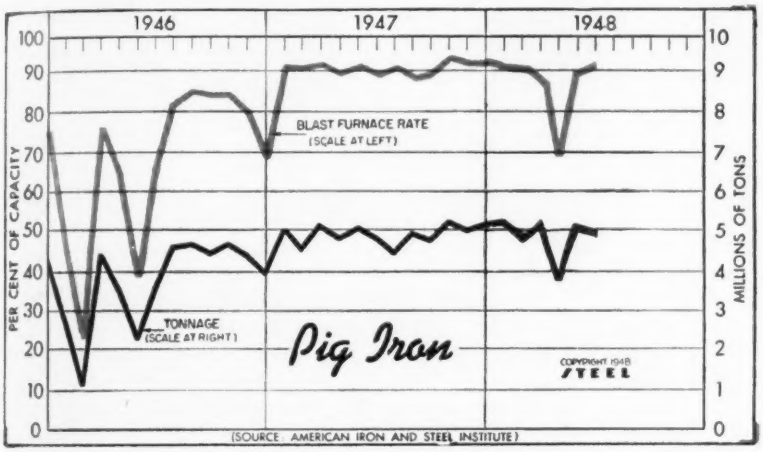
† Preliminary. ‡ Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1948	1947	1948	1947	1948	1947
Jan.	193	189	203	192	197	203
Feb.	194	189	203	191	197	208
Mar.	192	190	207	196	200	202
Apr.	188	187	177	195	198	197
May	191	185	206	197	197	187
June	192	184	206	193	193	179
July	...	177	...	181	...	172
Aug.	...	182	...	188	...	171
Sept.	...	186	...	195	...	174
Oct.	...	190	...	204	...	179
Nov.	...	192	...	202	...	185
Dec.	...	192	...	205	...	189
Ave.	...	187	...	195	...	186





Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	5,194	5,071	2,644	90.9	90.8	47.4
Feb.	4,838	4,550	1,148	90.6	90.3	22.2
Mar.	5,020	5,123	4,424	87.8	91.8	77.3
Apr.	3,840	4,830	3,614	69.4	89.3	65.2
May	5,077	5,081	2,274	88.8	91.0	39.8
June	4,990	4,810	3,682	90.2	89.0	66.5
July	....	4,585	4,705	...	90.3	82.4
Aug.	....	4,916	4,898	...	88.1	85.6
Sept.	....	4,801	4,687	...	89.0	84.8
Oct.	....	5,228	4,814	...	93.6	84.1
Nov.	....	5,015	4,435	...	92.8	83.0
Dec.	....	5,177	3,992	...	92.9	69.9
Total	....	59,210	45,318	Ave...	90.1	67.4

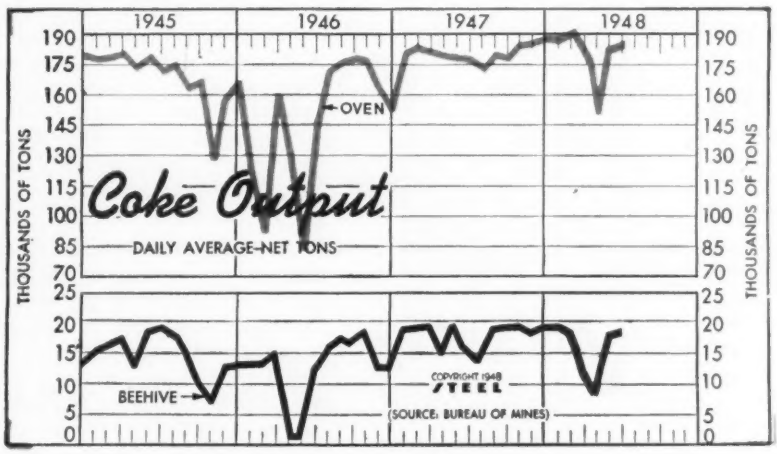
* Includes ferromanganese and spiegeleisen.

Coke Output

Bureau of Mines

(Daily Average Net Tons)

	Oven		Beehive	
	1948	1947	1948	1947
Jan.	189,191	181,245	19,554	18,124
Feb.	190,098	183,189	18,596	18,372
Mar.	182,340	182,529	10,458	18,725
Apr.	149,692	179,428	8,205	14,591
May	184,568	179,400	18,623	19,800
June	186,425	178,400	18,033	15,700
July	.....	173,312	.....	13,582
Aug.	.....	181,697	.....	18,346
Sept.	.....	179,872	.....	19,397
Oct.	.....	187,009	.....	19,786
Nov.	.....	188,342	.....	18,316
Dec.	.....	189,886	.....	19,454
Ave.	.....	182,027	.....	17,849



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,290	$13,016	$12,258	$12,086
Federal Gross Debt (billions)	$253.4	$253.4	$251.9	$259.4
Bond Volume, NYSE (millions)	$14.4	$14.5	$15.1	$14.6
Stocks Sales, NYSE (thousands)	3,863	4,490	4,232	3,592
Loans and Investments (billions)†	$63.1	$63.2	$62.6	$63.5
United States Gov't. Obligations Held (millions)†	$34,870	$34,879	$34,666	$38,739

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$90.05	$90.05	$80.27	$75.41
All Commodities†	168.3	168.2	166.7	151.3
Industrial Raw Materials†	183.4	184.6	184.3	165.6
Manufactured Products†	164.1	163.1	160.9	146.0

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

ORA E. CLARK

JOHN POAST

EDWARD H. PLATZ JR.

Ora E. Clark has been appointed general superintendent, Hamilton plant, Armco Steel Corp., Middletown, O., and **John Poast** has been made superintendent of the blast furnace department. Mr. Clark succeeds **J. S. Ferguson,** who has been appointed technical director of the newly formed Argentine Division, Armco International Corp. Mr. Poast succeeds Mr. Clark as blast furnace superintendent. Both appointments become effective Sept. 1.

—o—

W. G. Tapping, Los Angeles district sales manager, Cutler-Hammer Inc., Milwaukee, has been appointed manager of the West Electric Products Co., Los Angeles, recently acquired by Cutler-Hammer.

—o—

Thomas S. Nichols, president and chief executive officer, Mathieson Chemical Corp., New York, has been appointed to the additional post of chairman of the board to succeed the late **George W. Dolan. J. C. Leppart,** vice president, was elected a member of the board to fill the vacancy caused by Mr. Dolan's death, and was appointed executive vice president.

—o—

A. E. Whyman, managing director, E. W. Bliss Ltd., England, has been elected vice president in charge of European operations for E. W. Bliss Co., Detroit, which has plants at Derby, England, and St. Ouen sur Seine, France. Mr. Whyman, in addition to supervising operations at the English and French plants, will represent the parent company in the sale of presses, can machinery and rolling mills on the continent.

—o—

S. S. Auchincloss, vice president in charge of operations of the Buffalo Division, American Machine & Foundry Co., has been named head of the industry section, Economic Cooperation Administration Mission to Sweden. He has been granted a year's leave of absence by the American Machine & Foundry Co.

—o—

A. P. Heiner has been appointed assistant to the vice president in charge of public relations for the Iron & Steel Division, Kaiser Co. Inc., Oakland, Calif. Mr. Heiner has been with Kaiser Co. for the past six years, as general traffic manager, and will retain general supervision of that department in addition to the new public relations duties.

—o—

F. L. Burke and **Edward R. Godfrey** have been elected members of the board of directors, General Motors Corp., Detroit, and of the corporation's operations policy committee. Mr. Burke is vice president of General Motors in charge of the accessory group, and Mr. Godfrey is vice president in charge of the Dayton and Household Appliance Divisions.

—o—

Personnel changes in the reorganization of operating personnel and change in sales and manufacturing policy, Carbide Division, Firth Sterling Steel & Carbide Corp., McKeesport, Pa., include the appointments of **W. J. Loach** as manager, development and quality control; **Charles W. Iams Jr.,** manager, carbide production and fabrication, McKeesport plant; **E. G. Moffat,** works manager of the recently completed plant at Milford, Conn.; and **A. B. Vestal,** superintendent of plant engineering, at McKeesport. **L. G. Firth,** in addition to his duties as president, is accepting the office of director of technical development.

—o—

Edward H. Platz Jr., veteran steel executive in the development of alloy castings for special purposes, has been appointed manager, alloy sales, for Lebanon Steel Foundry, Lebanon, Pa. He became a member of the Lebanon Steel Foundry staff in 1939, and in the intervening years has devoted a considerable part of his time to engineering and metallurgical application of alloy castings to jet engine and gas turbine development. Mr. Platz succeeds **William B. Sullivan,** retired after 45 years in the industry.

—o—

Louis W. Mason has been appointed assistant to the general manager of sales, National Tube Co., U. S. Steel Corp. subsidiary. He has been Pittsburgh district manager of sales for the company. Succeeding Mr. Mason in that district is **Henry C. Hoar,** formerly manager of sales at St. Louis. **Glendon P. Robb** succeeds Mr. Hoar at St. Louis.

—o—

Hufford Machine Works Inc., Redondo Beach, Calif., announces appointment of **Walter G. Wheeler** as chief engineer. He will have charge of the engineering department and improvement and development of Hufford hydraulic equipment.

—o—

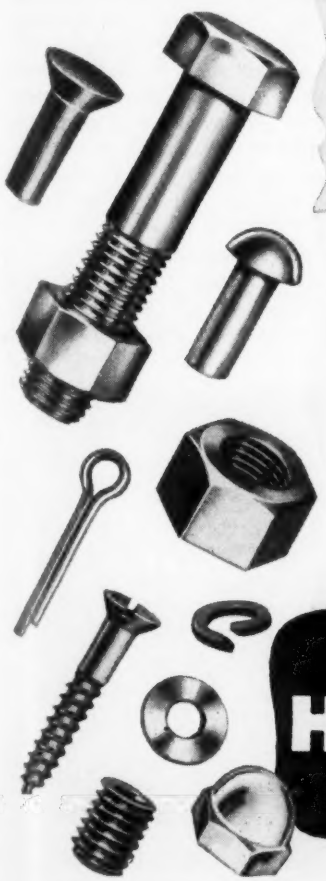
Pennsylvania Transformer Co., Pittsburgh, announces appointment of **Douglas J. Munhall** as sales representative in upper New York State, which includes Buffalo, Syracuse, Rochester, Albany, Binghamton, and surrounding territory. Mr. Munhall had been a sales engineer for Union

It's Harper Everlasting Fastenings

10 TO 1 over common steel

1. Resistance to Rust and Corrosion
2. Resistance to High Temperatures
3. Non Magnetic
4. Non Sparking
5. Re-usable
6. Attractive Appearance
7. Easy to Clean
8. High Strength
9. Long Life
10. Lower Ultimate Cost

Common steel—lower first cost only



An amazing combination of advantages in favor of non-ferrous and stainless bolt and nut products . . . only lower first cost in favor of common steel.

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Bolts, Nuts, Screws, Washers, Rivets, Accessories . . . Harper maintains stocks of over 5,000 different items in Chicago and New York . . . large quantities of each. Others being added constantly. Specials made to order from ample stocks of raw materials. Write for catalog.

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HARPER'S 25th Anniversary

Carbide & Carbon Corp. in New York and Cleveland, and spent some time as a sales engineer in Chicago. He recently returned to Buffalo where he organized Douglas J. Munhall Co.

—o—

Appointed to the staff of **C. D. Hepler,** general manager of the recently formed construction materials department, General Electric Co., Bridgeport, Conn., are: **A. W. Gilmore,** formerly manager, Wire & Cable Division, who becomes manager of marketing; **James H. Crawford,** manager of sales, who becomes sales consultant; **Edmund J. Harrington,** manufacturing manager, General Electric affiliated manufacturing companies department, New York, who becomes manager of manufacturing of the new department; and **C. Howard Black,** works engineer for the company's Philadelphia plant, who becomes manager of engineering. At the same time Mr. Hepler announces several changes in the divisional structure of the construction materials department, which involves the establishment of Accessory Equipment and Wiring Device Divisions as separate operating units, and the transfer of the sales functions of Tungar & Metallic Rectifier Divisions to the G-E apparatus department. **Theodore D. Foster,** formerly manager of sales, Accessory Equipment & Wiring Device Divisions, has been given responsibility for the Accessory Equipment Division, and **Joseph J. Lengyel,** formerly manager of sales, Tungar & Metallic Rectifier Division, now heads the Wiring Device Division.

—o—

Appointments to two key positions in the engineering department, American Steel & Wire Co., Cleveland, U. S. Steel Corp. subsidiary, are announced as follows: **James McCulloch,** veteran of 33 years' service with the company, was named superintendent of construction. **Frederick C. Keiser,** for five years section head draftsman in the engineering department, was named merchant products engineer.

—o—

Carl H. Wittenberg has been elected executive vice president, Gladding, McBean & Co., Los Angeles, producer of ceramic products on the Pacific Coast. He previously had been manager, Southern Division, Columbia Steel Co.

—o—

Dr. Frank D. Carvin, head, mechanical engineering department, and chairman of the graduate division at Newark College of Engineering, Newark, N. J., has been named head of the department of mechanical engineering at Illinois Institute of Technology, effective Sept. 1, when **James C. Peebles,** dean of engineering, retires, and **Dr. John T. Rettaliata,** present head of mechanical engineering, becomes dean.

—o—

Edward L. Usner, since 1943 president, Ross Gear & Tool Co., Lafayette, Ind., has been appointed assistant to **P. O. Peterson,** vice president in charge of manufacturing for Studebaker Corp., South Bend, Ind. He started with the Ross company in 1914, left in 1919 to enter industrial engineering work, and rejoined the company in 1937. **Bernard M. Finnigan,** active with Studebaker in industrial relations work since 1942, has been named director of management information, a newly created post.

—o—

Ohio Equipment Co. Inc., Cleveland, announces it has recently opened a new office in Mansfield, O., with **James B. Cunningham** as manager. Mr. Cunningham was formerly associated with Yale & Towne Mfg. Co., Philadelphia Division, and more recently was with the service department of Ohio Equipment Co. Inc.

—o—

Dr. William M. Baldwin Jr., an associate of Chase Brass & Copper Co., Cleveland, for some years, has been made research professor of metallurgy at Case Institute of Technology, Cleveland.

—o—

Hobart C. McDaniel has been appointed manager, technical press service, public relations department, Westinghouse Electric Corp., Pittsburgh. He succeeds **Carl E. Nagel,** who has resigned to join McGraw-Hill Book Co., New York. Mr. McDaniel joined Westinghouse in 1939 as commercial engineer in the Bloomfield, N. J., Lamp Division, and in 1943 joined the technical press service in the Pittsburgh office.

—o—

Rudel Machinery Co. Inc., New York, announces personnel changes as follows: **David F. Robinson,** who recently joined the organization, and **William E. Rudel** have been appointed vice presidents and district sales managers. Mr. Robinson will be in charge of the New York and Hartford, Conn., territories, and Mr. Rudel, in charge of the Boston office and the other five New England states. Mr. Robinson will also handle the company's Schenectady, N. Y., accounts. **Ransom Soper** has joined the organization, and will take charge of the Long Island territory. **George E. Tcimpidis** has joined the firm as chief engineer, and **J. E. Bayley** has joined in the capacity of hydraulic engineer specializing for Logansport Machine Co. as a member of Rudel Machinery Co.'s organization.

—o—

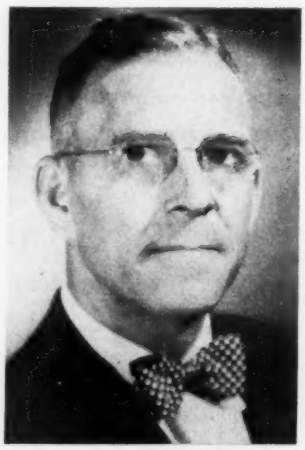
Howard Stevens has joined Saval Inc., Los Angeles, as head of industrial sales promotion. For the past 11 years, Mr. Stevens has been associated with Watson-Stillman Co., covering the northeastern section for its special hydraulics division.

—o—

Baldwin Locomotive Works, Pittsburgh, announces election of **Marvin W. Smith** as its executive vice president. Mr. Smith has been associated with Westinghouse Electric Corp. where he was vice president in charge of engineering and research, and an authority on power plant design and development. Mr. Smith is succeeded at Westinghouse by **A. C. Monteith,** engineering executive of the corporation.

—o—

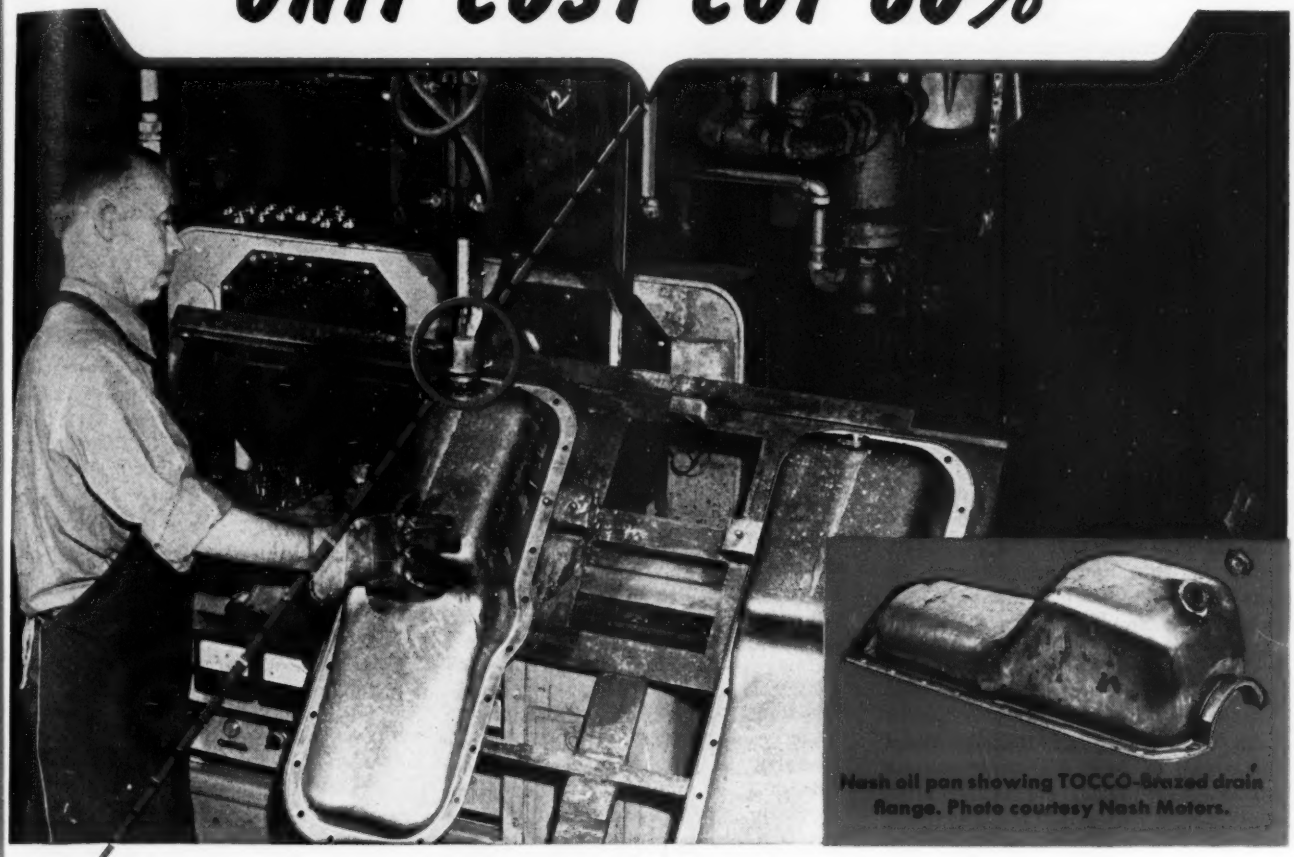
Arthur J. Blair, Tennessee Coal, Iron & Railroad Co., has been elected president of the Engineers Club of



HOBART C. McDANIEL

MARVIN W. SMITH

PRODUCTION TRIPLED! UNIT COST CUT 60%



Nash oil pan showing TOCCO-Brazed drain flange. Photo courtesy Nash Motors.

with TOCCO* Induction Heating

Even if your products are entirely different in size and shape TOCCO can probably provide similar cost reductions and production increases for you.

• *Nash Motors,* Kenosha, Wisconsin reports the following benefits from TOCCO Induction brazing of drain flanges to automobile oil pans:

1. PRODUCTION TRIPLED— Using a hand torch, production was only 21 brazed assemblies per hour. TOCCO brazes 75 per hour—357% of former output!

2. COSTS CUT—At the same time TOCCO Induction brazing cuts labor and material costs from $12.75 to $4.90 per hundred—a reduction of 60%, representing a saving of $6.00 every hour.

3. OTHER ADVANTAGES—include a neater, better looking brazed joint, and a complete elimination of leakers and subsequent repair costs.

TOCCO Engineers are glad to help you find applications in your plant where TOCCO Induction Heating would increase your production, cut your costs and improve your products.

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Name _____

Position _____

Company _____

Address _____

City _____ Zone _____ State _____

Birmingham. **C. P. Shook Jr.** has been named vice president, and **T. Etheridge Gilliam,** secretary.

—o—

O. E. Ostrom, formerly with Carnegie-Illinois Steel Corp. at St. Louis, and Sheffield Steel Corp. at Houston, has been appointed purchasing agent of Southwest Steel Products, Houston.

—o—

At the recent International Powder Metallurgy Conferences held at Graz, Austria, the honorary degree of Doctor of Technical Sciences was conferred by the Technische Hochschule of Graz on the following men: **Dr. W. D. Jones** of London, **Dr. Paul Schwarzkopf** of Yonkers, N. Y., **Prof. J. A. Hedvall** of Goeteborg, Sweden, **Prof. A. F. Joffe** of Moscow, and **Prof. L. Neel** of Grenoble, France.

—o—

William G. Brown has been made sales manager for all six divisions of the Howard Foundry Co., Chicago. Prior to this new appointment he was Chicago district manager for Bohn Aluminum & Brass Corp. for 14 years, and at one time was sales manager of Werra Aluminum Co.

—o—

John G. Hocking and **Harold Ward** have been appointed accountants for the Conduit Products Division, General Electric Co., at Bridgeport, Conn. **Harold J. Lee** has been appointed cashier and paymaster of the construction materials department.

—o—

Dr. Karl T. Compton, president, Massachusetts Institute of Technology, and **Merrill Griswold,** chairman, Massachusetts Investors Trust Co., have become directors of Tracerlab Inc., Boston.

—o—

E. Armand Thomas, president, Thomas Foundries Inc., Birmingham, has been elected temporary chairman of the newly organized Alabama Group of Gray Iron Founders' Society.

—o—

New appointments announced by General Detroit Corp., Detroit, are: **E. A. Warren,** formerly vice president in charge of sales, has been elected executive vice president, with the policies of the Fire Extinguisher, Fire Apparatus, Fire Hose, and Industrial Divisions co-ordinated under his jurisdiction. **A. B. Seigfreid,** formerly sales manager, Fire Truck Division, assumes the position of vice president in charge of manufacturing. **Preston W. Wolf,** formerly assistant to the vice president, succeeds to the post of assistant general sales manager. Other appointments include: **M. S. Shoppert** to the position of assistant sales manager for fire extinguishers; **H. A. Thompson,** assistant sales manager for apparatus; **R. O. Beushline,** assistant sales manager for fire hose and industrial; **Roy H. Morrison,** central divisional manager; and **Gail M. Rutledge,** midwestern divisional manager. All of the appointees are veteran employees of the corporation.

J. M. HAUGHEY

R. E. DAHLIN

—o—

Washington Iron Works, Seattle, announces appointment of **J. M. Haughey** to the newly created position of sales manager. Mr. Haughey, formerly sales manager, Industrial Division, Packard Motor Car Co., will direct sales activities for all major Washington Iron Works products, including diesel engines, logging machinery, gold dredges, and varied industrial equipment.

—o—

Mel E. Maurer, formerly chief manufacturing engineer for Hotpoint Inc., at Chicago, has been appointed superintendent of the company's electric dishwasher and water heater plant at Milwaukee.

—o—

International Business Machines Corp., New York, announces appointment of **Richard E. Predmore** as manager of customer engineering for Electric Typewriter Division. He was previously supervisor of customer engineering at St. Louis.

—o—

Howard B. Barr has been named training manager for Columbia Steel Co., San Francisco, subsidiary, U. S. Steel Corp.

—o—

Gerald von Stroh, Exton, Pa., has been selected director of the bituminous coal industry's program to develop a continuous mining machine. Mr. Van Stroh's present position is that of assistant manager, Development Engineering Division, Lukens Steel Co., Coatesville, Pa. He has served in engineering capacities for Kaiser Services, Hughes Aircraft Co., and Consolidated Aircraft Corp.

—o—

R. E. Dahlin recently became affiliated with Wellman Bronze & Aluminum Co., Cleveland, as its western representative. A resident of Dallas, Tex., for 20 years, Mr. Dahlin has devoted most of this time working with industrial and metal products manufacturers in Oklahoma and Texas.

—o—

Charles A. Crowl has been elected president, Electroweld Steel Corp., Azusa, Calif.

—o—

H. G. Rethmeyer, Pacific Coast manager, Marine & Aviation Divisions, Westinghouse Electric Corp., has been placed in charge of transportation and sales of the company's West Coast area.

—o—

John E. Fasano has been appointed sales manager of the recently created Spirolox Retaining Ring Division, Ramsey Corp., St. Louis. He has been sales manager of the Truarc Retaining Ring Division, Waldes Kohinoor Inc.

—o—

Waldemar Naujoks has recently joined the staff of Girard Associates, forge and press shop engineers, with main offices in Chambersburg, Pa. Mr. Naujoks was for many years chief engineer, Steel Improvements Forge Co., Cleveland, and more recently manager of the Forged Valve Division, Ohio Injector Corp., Wadsworth, O.

—o—

Robert J. Russell has been elected secretary, Hardinge Co. Inc., York, Pa., and also has been appointed chief of the technical staff of the Hardinge organization, thereby as-

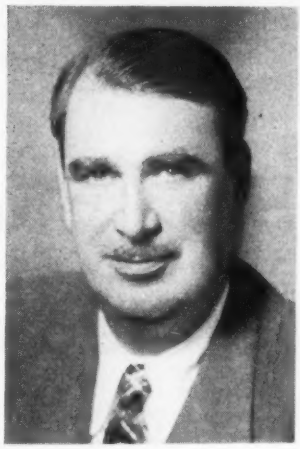
suming responsibility for co-ordinating all equipment application requirements for all the industries to which Hardinge sells.

—o—

Dr. Norris Steinberg has recently joined the metallurgy department of Horizons Inc., Princeton, N. J., and will have headquarters at Cleveland.

—o—

C. B. Dick, manager, Feeder Division, East Pittsburgh Works, Westinghouse Electric Corp., has been appointed works manager of the company's East Springfield, Mass., Appliance Division plant. He succeeds **James R. Weaver,** who has accepted a position with Baldwin Locomotive Works at Philadelphia, under **Marvin W. Smith,** former Westinghouse executive. Both Mr. Smith and Mr. Weaver became associated with Baldwin Locomotive Works after Westinghouse purchased a stock interest in the locomotive company.



M. W. ROWELL

—o—

M. W. Rowell, former executive director of the Committee on Small Business, U. S. House of Representatives, and special consultant to the U. S. Senate on Small Business, has been named Washington representative for Service Caster & Truck Corp., Albion, Mich., and Somerville, Mass., which makes a complete line of materials handling equipment.

—o—

The board of directors of Williams & Co. Inc., Pittsburgh, has been increased to include four additional members of the firm's organization. These new directors are: **L. B. McGrew, R. C. Waldie, J. H. Penske Jr.,** and **W. P. Dettwiler.** Mr. McGrew is assistant manager in charge of all warehouse operations; Mr. Waldie is manager of the company's welding wire and boiler tube department; Mr. Penske is district manager of the company's Cleveland branch operation; and Mr. Dettwiler is manager of the Cincinnati warehouse operations.

OBITUARIES . . .

Morrill Dunn, 77, vice president and director, McCord Corp., Detroit, died Aug. 7 in Desbarats, Ont. He had been associated with the auto radiator company since 1899, and for the last 19 years had lived in Grosse Point, Mich.

—o—

James E. Hayes, 75, retired president and chairman, New Jersey Zinc Co., New York, died Aug. 6 at the Harkness Pavilion, Columbia-Presbyterian Medical Center. He was president of the company from 1927 to 1943, when he retired. He continued with the concern as chairman until 1946.

—o—

William H. Riddell, 53, president, Riddell Engineering Co., Birmingham, died Aug. 4 after a brief illness. Prior to moving to Birmingham nine years ago, Mr. Riddell was secretary and treasurer, Diamond Iron Works and Mahr Mfg. Co., Minneapolis.

—o—

W. L. Turner, 86, retired civil engineer, Sloss-Sheffield Steel & Iron Co., died recently at his home in Birmingham.

—o—

James P. Dovel, 79, consulting engineer and former vice president, Sloss-Sheffield Steel & Iron Co., Birmingham, died recently after an extended illness.

—o—

John A. Coe, 79, former president, American Brass Co., Waterbury, Conn., who retired as chairman of the board in 1945, died at his home in Waterbury Aug. 4. He joined the company in 1903 as sales manager and became president in 1920, a post he retained until about 20 years later when he became chairman.

—o—

Robert L. Cleland Sr., 71, retired, died Aug. 6 in Buffalo. He organized the Eastern Clay Products Co. Mr. Cleland was a member of the American Foundrymen's Association.

—o—

Samuel L. Orr, 75, president for 30 years of Orr Iron Co., Evansville, Ind., organized by his grandfather, Samuel Orr, in 1835, died recently. He was one of the organizers of the American Steel Warehouse Association.

—o—

Walter F. Piper, 63, retired vice president, Beardsley & Piper Co., Chicago, was killed Aug. 5 near Chapelle, Neb., when his private plane crashed.

—o—

M. M. Clark, 55, district sales manager at Canton, O., for Climax Molybdenum Co., died Aug. 8. Mr. Clark previously had been Chicago district metallurgical representative of Republic Steel Corp. and of Carnegie-Illinois Steel Corp.

—o—

William H. Harrison, retired research director, Continental Can Co., died Aug. 7 in North Hollywood, Calif., where he had lived since his retirement two years ago. He joined Continental in 1923.

—o—

Neil C. Hurley, 78, chairman, Independent Pneumatic Tool Co., Chicago, died Aug. 3. He, with his brother, had organized Hurley Machine Co. in 1906, later leaving to join another brother in Independent. He became president in 1933 and chairman in 1944.

—o—

Clayton Mark Jr., 59, vice president, Clayton Mark & Co., Evanston, Ill., manufacturer of steel tubing, conduit and related items, died Aug. 3 of a heart attack. In 1912 he joined his father in Mark Mfg. Co., Chicago steel firm, which later was merged with Steel & Tube Co. of America. A year after sale of the company to Youngstown Sheet & Tube Co. in 1923, Mr. Mark and his father and brother organized Clayton Mark & Co., Chicago. The company was moved to Evanston in 1938.

—o—

Herbert C. Greer, president, Greer Steel Co., Dover, O., died Aug. 5 at his home in Morgantown, W. Va.

—o—

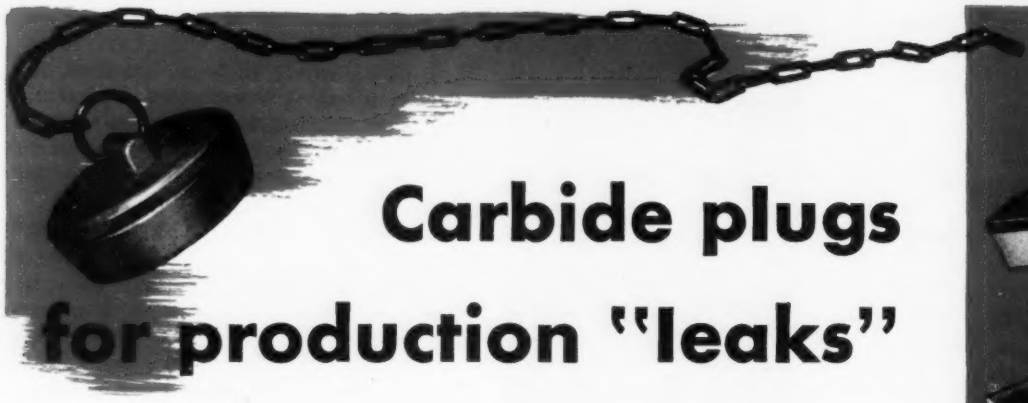
David A. Burt, 72, one of the founders of Wheeling Steel Corp., Wheeling, W. Va., died recently. He retired in 1943, but held directorship in the corporation and in Woodward Iron Co., Birmingham.

—o—

H. L. Morrow, vice president and treasurer, Alabama By-Products Corp., Birmingham, died Aug. 2. He had been connected with the company since it was founded in the early 1920s.

—o—

E. Arthur Tutein, 76, president, Tutein Corp., New York, and many years identified with the iron and steel industry, particularly in such products as pig iron, ores and other raw materials, died at his summer home in Winchester, Mass., Aug. 4.



Carbide plugs for production "leaks"

Recently a Carboloy engineer was called into a plant to help eliminate a known "leak" in production efficiency.

Chips were piling up in a boring machine, finishes were torn, tools wore "like sixty" . . . carbide tools, at that!

The Carboloy engineer investigated, figured, came up with a startlingly simple answer: *He recommended double the work speed*, and a slight change in tool design.

Result? Nearly doubled output, cleaner finish, much longer tool life, and a switch from special tools to lower priced standard Carboloy tools, too!

Call for Carboloy "Know-How"

In your constant effort to obtain peak efficiency, back up the intimate knowledge of your own production men with the specialized "know-how" of Carboloy engineers. Carbides are their business. They bring to your plant a broad experience in obtaining maximum results with carbides.

Often, slight changes in tool design, speeds or feeds, grinding, or tool handling effect far reaching economies and increases in out-put.

Together, your engineers and our Carboloy specialists can form a team nothing can stop. Together they can use carbides to plug up many drains on your plant's productivity.

Ask for your Carboloy engineer

Call in your Carboloy engineer. He'll be glad to help with your carbide application problems, or in the selection of the most economical tooling from any of Carboloy's 600 standard tools and blanks, or special Carboloy-tipped tools made by more than 150 tool manufacturers.

Why not call your Carboloy engineer? Or write us direct: Carboloy Company, Inc., 11141 E. 8 Mile Street, Detroit 32, Michigan.

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Engineering News . . . AT A GLANCE

SIMPLIFIED SERVICING— Use of a new pneumatic control mechanism in the latest flow controlling system now produced by Fischer & Porter Co., Hatboro, Pa., allows entire assembly to be removed from each instrument for cleaning or repair without disturbing the process involved. Servicing is accomplished by simply flicking a valve, disconnecting an air line and removing four screws. A housing which is cast in one piece is instrumental in maintaining all component parts in a positively fixed relationship to each other.

EASES THREAD INSPECTION- Very fine cracks in the bottom of sharp V-threads are readily located, and small fatigue cracks which may be incipient failures are quickly detected on collars and joints used in oil field work by the latest method developed by Magnaflux Corp., Chicago. It consists of the use of Magnaglo—inspection particles that are fluorescent and brilliantly outline cracks when illuminated by black light. In the procedure, parts are properly magnetized and the special particles, in liquid form, are applied by spraying. Black light is then introduced under a hood which eliminates daylight. Any cracks present are clearly shown marked by a yellow-green glow against a dark blue background. Cleaning before inspection is not as critical as when using the dry powder method.

IMPACT "SOFTENER"— System whereby tires are used under conveyor belting to cushion the impact of falling rocks and coal lumps was developed recently by Goodyear Tire & Rubber Co., Akron, O. Acocrding to the company, use of tire has already successfully protected belts against the shock of 300-pound boulders falling 12 feet—an impact of 43,000 inch pounds.

WIDENS USE OF STAINLESS TUBING— Use of stainless steel piping systems is expected to be increased both in chemical food processing and other types of industrial plants by a new method of joining lightwall stainless piping and fittings developed recently by H. K. Ferguson Co., New York. Process used in the joining procedure, referred to as cold-Vanstoning, "bolts" together the two members—fittings and piping by means of carbon steel split-type backup flanges. According to the company, the joining procedure can be accomplished with a specially-designed hydraulic machine which can be operated at the job site. Latter is adaptable to any size stainless tubing, and shapes flanges by rolling tube ends to the proper form.

OXYGEN USE REQUIRES FURTHER STUDY— If maximum benefits are to result from the use of oxygen to speed up steel production, the economics of interrelated operations from the blast furnace through the open hearth must be thoroughly weighed, W. H. Mayo, metallurgical engineer, Carnegie-Illinois Steel Co., told members of the AISI recently. If open hearth operations are speeded by using oxygen or by other means, there will be a shortage of pig iron from the blast furnaces, he pointed out. Increased production of existing blast furnaces may possibly be achieved by using oxygen in the blast or by carefully planned preparation of raw materials which may mean that current ideas on blast furnace design, and raw material form may have to be altered quite radically.

"HOPPING" HOPPER CARS—Twenty-five or more 70-ton railroad hopper cars now are produced daily in the Huntington, W. Va., plant of American Car & Foundry Co., since adoption of complete welding operations and a new assembly line technique. One device, instrumental in pushing output to higher levels is a 4-station production line jig served by improved welding gantries. It enables the plant to produce 50 to 54 car sides every 16 hours. Over a third of a mile of welds is used in each car, 670 feet of which are applied by flashless automatic and semiautomatic methods. Main production line is "geared" so only eleven positioning moves are made in joining together the seven subassemblies required to complete each car. (p. 90)

POTENTIAL FORGING AID—Although installation of induction heating units on a large scale in existing forging plants requires considerable wiring, and the use of special power lines, real advantages that could be derived from this method of heating forgings are many. In enumerating these advantages, Waldemar Naujoks points out that such installations would take up very little room. Furthermore, induction heating units heat pieces uniformly to their proper temperature without scale. The latter is highly important because forging scale is one of the causes of impression die wear. Die impressions are expensive, and any improvement in the life of the die impression is highly desirable. (p. 94)

GUIDE FOR KEY MEN—Key man in today's large production industries is the toolmaker. He is the man upon whom the responsibility rests for obtaining and treating the necessary tools which afford the highest quality production with attendant low tooling investment. Problem of selection is not easy as there are literally thousands of different cutting materials available. To aid these key men, STEEL's editors are presenting a compilation which includes complete information on cutting tool and die materials—one that lists factors to be considered in the quick selection of tool steels and carbide types to meet any given requirement. (p. 98)

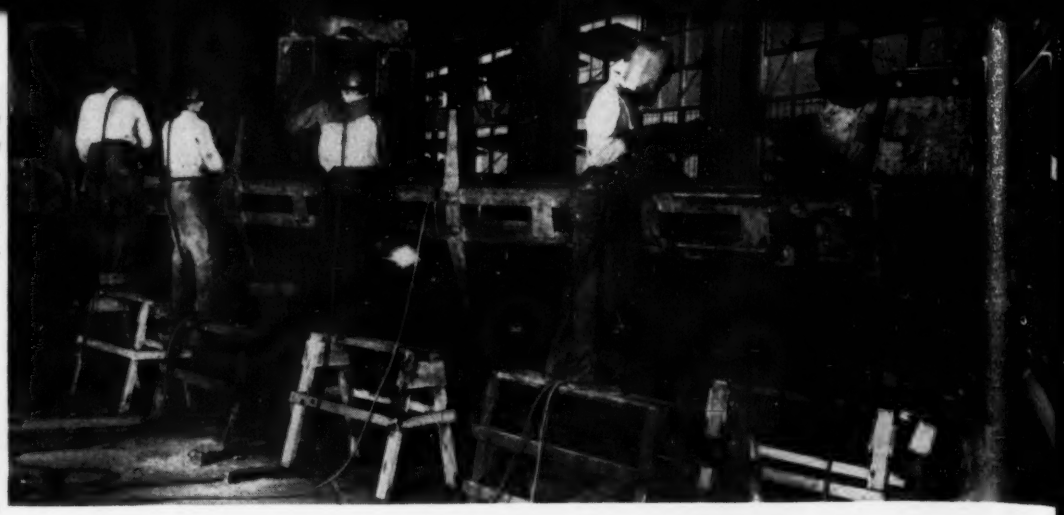


Fig. 1—Center sills are subassembled for the erection track by being held in a downhand position for welders by means of a rotator

Motor Industry Methods

Applied to Hopper—Car Manufacture

Subassembly lines feed at right angles to main production line. Rate of 25 or more cars per day helping to increase coal carrying capacity of Chesapeake & Ohio Railway

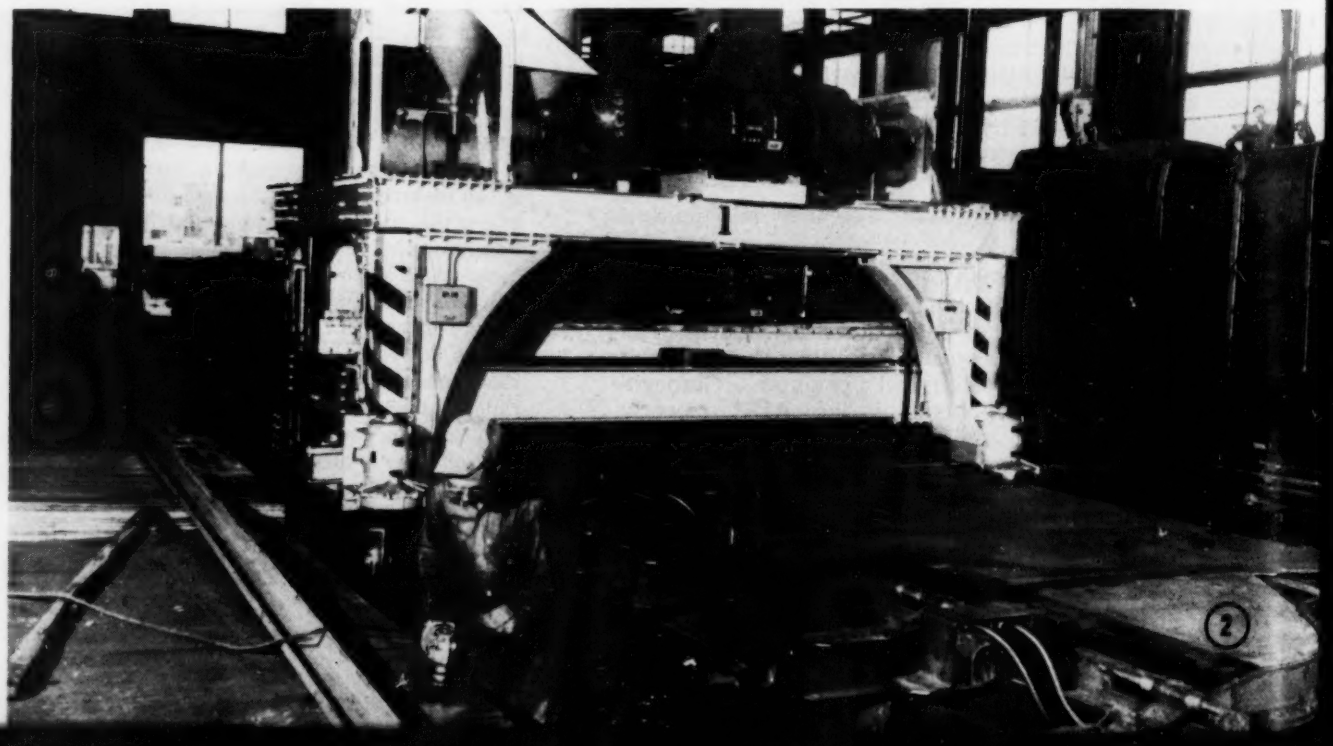
INTRODUCTION of complete welding operations and a new assembly line technique has resulted in an extraordinary production rate of 25 or more 70-ton coal hopper cars daily at the Huntington, W. Va., plant of American Car & Foundry Co. Cars are being manufactured for Chesapeake & Ohio Railway, with over 1250 of an order of 6000 cars already in service.

There is over a third of a mile of welds in each car, 670 feet of which are produced by flashless automatic and semiautomatic means. Manufacture of all-welded sides has reached a new high in production technique. In a 4-station production line jig served by improved type welding gantries 50 to 54 car sides are produced every 16 hours.

Seven subassemblies are fed separately into main production line so that it takes only eleven positions for a car to reach completion, ready for painting and lettering. In just 3 hours after the underframe and car trucks have been joined, car rolls away from assembly line to paint track.

Subassembly lines feed at right angles to main assembly line. First is the underframe, consisting of bolsters, hopper supports and two ship channels face to face to reduce width of sill causing less obstruction

Fig. 2—Side sheet emerging from first gantry after cross seams have been welded making a continuous sheet of steel. It is then rolled along jig on rollers to next position



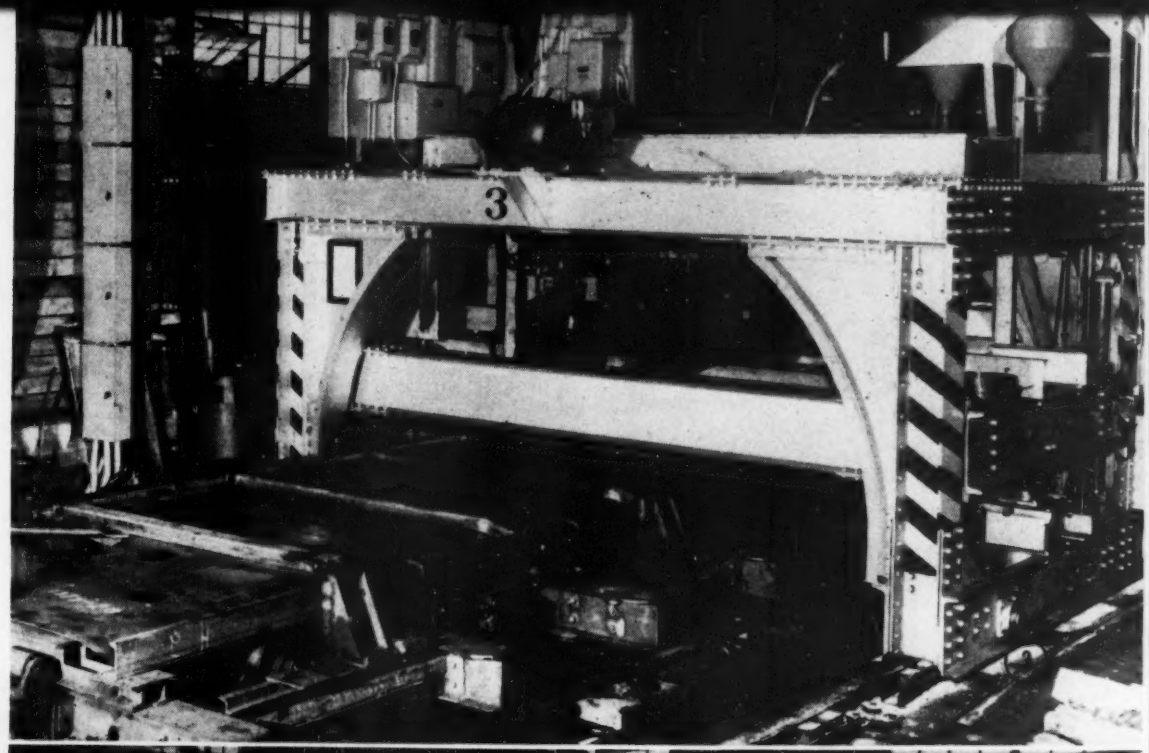


Fig. 3 — Side stakes are set in place and guides are flopped over to hold them in place. Both sides of stake are welded to side sheets at the same time

Fig. 4—At first station on main assembly line, center sill is lowered from an overhead crane onto trucks

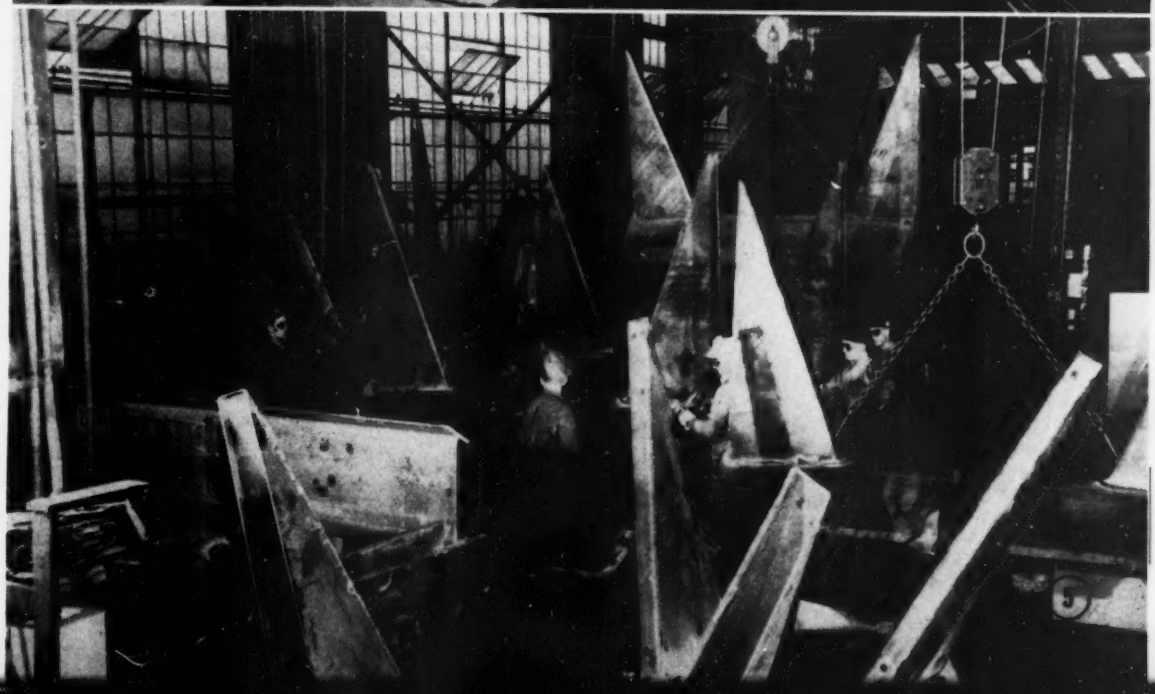


Fig. 5 — Cross ridges which have been assembled by hand welding and semi - automatic submerged arc are positioned here

Fig. 6—Floor sheets are applied and tack welded into place for further welding at a subsequent station

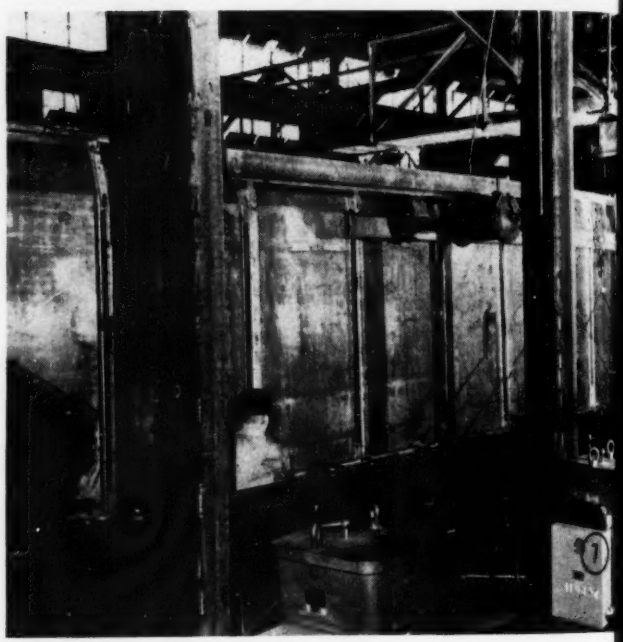
Fig. 7—Car takes its final shape as two fixed and two moveable pneumatic jacks rigidly clamp sides to car for welding

when load is dumped. Bed feeds into the line where completed trucks are positioned and car begins to take shape.

At the third subassembly position hoppers are applied and hopper doors fitted. Cross ridges, which are shapes that tightly bind sides to floors and hoppers, are next applied. Floors which provide slope to speed unloading of coal are installed and with addition of ends and sides car is basically complete.

Up to the eighth, ninth and tenth positions various subassemblies are tack welded into place. At these stations three rotator jigs are used and all seams are hand welded. Cars when placed in the rotators are mechanically secured in position for downhand welding. One rotator turns 90 degrees one way, the next 90 degrees the other way and finally the last of the three turns the car completely upside down.

At the last position before being switched to the paint track the brake cylinders, hand holds, hand brakes and other accessories are applied, making a complete car ready for its protective coating and for operation in revenue service.



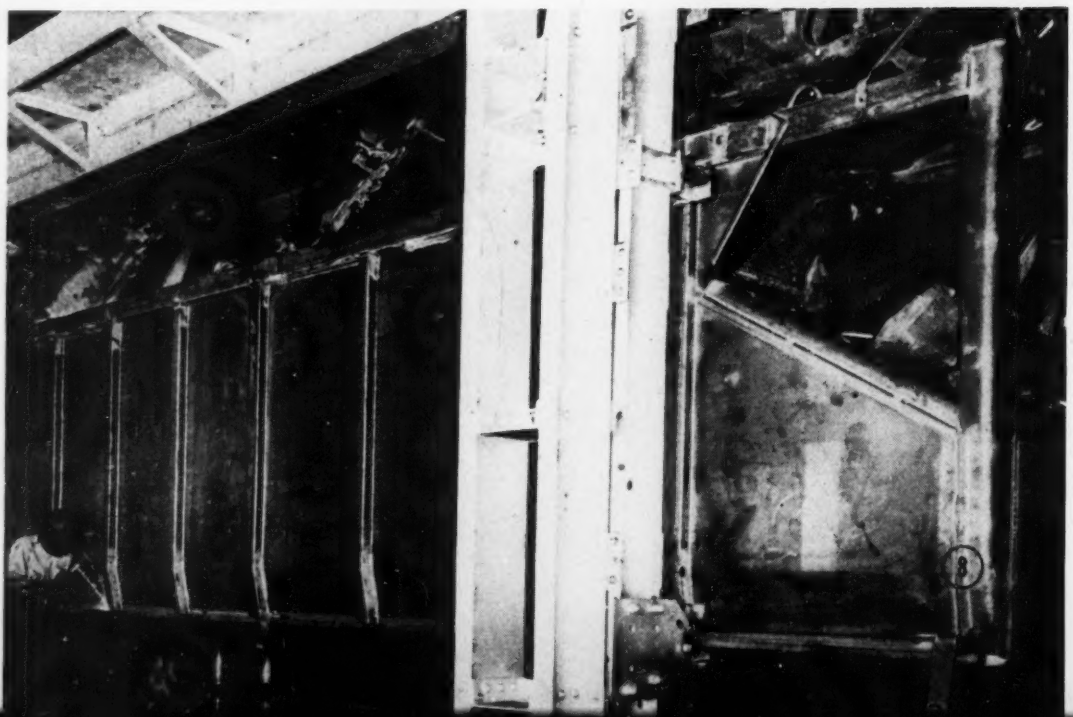


Fig. 8 — Last of three rotators turns car upside down for final welding of underside and under top rail

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

I VISIT THE DEVLIEGS: On August 2, I called on the DeVlieg Machine Tool Co., Ferndale, Mich., at what turned out to be the psychological moment. Charles B. DeVlieg, president, and R. A. Smith, sales manager, were making final preparations for departure to England to attend the famous British Machine Tool and Engineering Exhibition.

This counterpart of our own National Machine Tool Show is held at Olympia Exhibition Hall in London. It is sponsored by the British Machine Tool Trades Association, which is the "opposite number" of our own National Machine Tool Builders' Association.

Getting back to the subject of my visit to the DeVlieg plant, it turned out to be at the psychological moment because Mr. DeVlieg was on the verge of trying out an illustrated talk on "New Arts in the Field of Precision Boring". This he is scheduled to deliver before a group of engineers in London on August 24, 1948. He needed an audience for his try-out. I arrived just in time to serve as that audience.

Charles B. DeVlieg long has been one of America's most active inventors of machine tools. In the course of his career he has come up with a number of revolutionary ideas in metalcutting. About 20 years ago he introduced a successful method of "climb milling" which in his forthright language he described as "cutting metal in a milling machine just like a dog digs a hole in the ground."

More recently he has developed a system and a series of horizontal spindle machines which apply directly to production work, precision location and sizing of holes formerly associated only with jig, fixture and tool work. Quick acting spacing, sizing and indexing mechanisms which "sidestep" conventional measuring and gaging are built right into his machines. Even on big, rugged parts outboard boring bar supports are not used.

After hearing Mr. DeVlieg's down-to-earth lecture —which he illustrates with action pictures of equally down-to-earth jobs such as boring of gear cases for shop tractors—I predict that those British engineers are in for a mental "lift" comparable to the physical lift which they would get if only they could sink their teeth into some of those thick, juicy Michigan apple pies which I encountered up there in Ferndale.

Charles B. DeVlieg is one of many practical machine tool men who are on their way across the Atlantic to attend the Olympia show. There they will rub elbows and swap information with the solid men of British industry.

In this day and age of mechanization, much more in the way of international understanding and good will come out of this frank "give-and-take" at Olympia—and subsequently in pubs and clubs in all the industrial centers of Great Britain—than ever could be accomplished over crumpets and tea by a swarm of professional diplomats meeting in marble palaces.

PAYSON BLANCHARD'S PLAN: For 28 years it has been my good fortune to get together every now and then with E. Payson Blanchard of the Bullard Co. In all the years during which I have known him, Payse invariably has had something on his mind for the good of industry.

I first met him in July 1920 at the Sheffield Scientific School of Yale University, New Haven, Conn. We both were attending a conference called together by Professors Dudley, Seward and others to lay plans for that now historic series of New Haven Machine Tool Shows.

Payse, who at that time was advertising manager of Bullard, had much to do with laying the groundwork for those New Haven shows—the success of which in turn was no small factor in encouraging the National Machine Tool Builders' Association to launch their own series of Machine Tool Shows beginning in 1927.

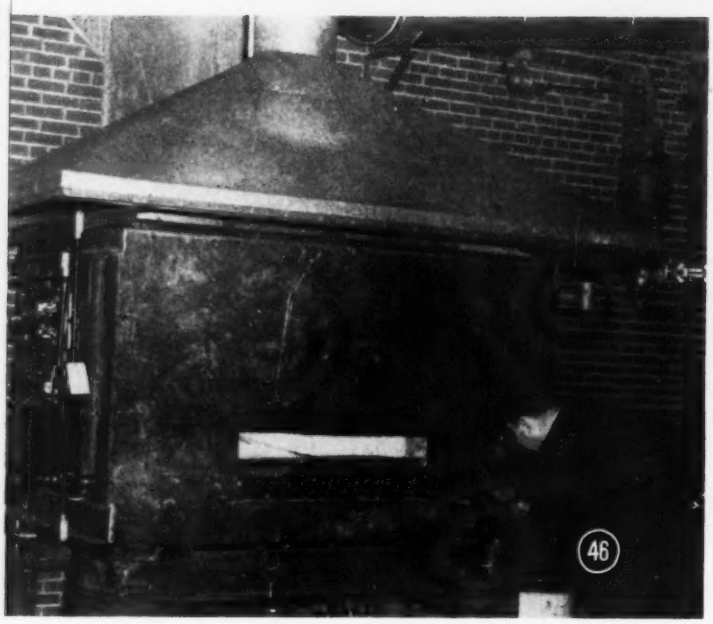
My most recent meeting with Payse, now director of sales for Bullard, again was in academic surroundings. This time it was at Cornell University, Ithaca, N. Y., on July 15, 1948. On that day he gave a talk at the Sales Refresher Course on "Selecting the Equipment to Be Offered". In this talk he drove home the point that this phase of selling demands not only sound engineering knowledge on the part of the salesman but also equally sound knowledge of business administration and economics of manufacturing.

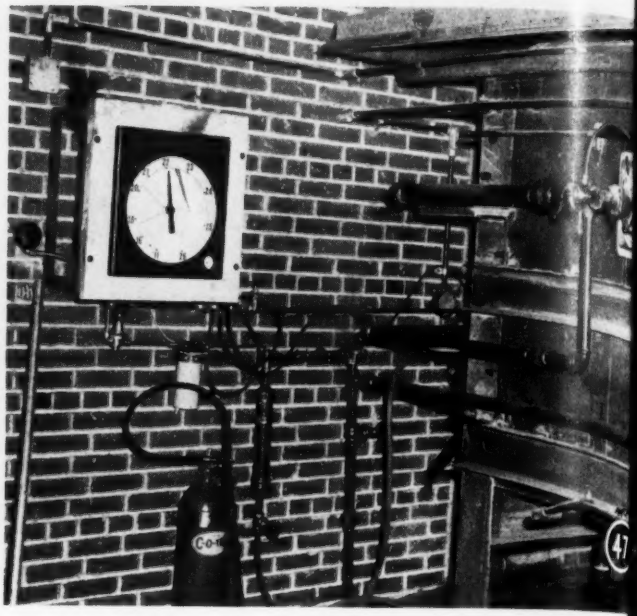
Following his lecture Payse Blanchard and I had one of our customary discussions about the machine tool situation in general—and in this case about the scrap situation in particular.

"I can't let your recent editorial regarding scrap pass without some comment," said Payse. "True enough, in machining many forgings and some castings there is an appreciably less amount of scrap created today in the form of chips. I wonder, however, if scrap in the form of chips is such an appreciable item in the overall scrap picture.

"I may be monotonous in reverting now to that old subject of scrapping machines. However, I do believe that the existing scrap situation warrants its reiteration. It certainly seems to me that a nation-wide campaign to scrap old and inefficient machines should be put into active effect right now.

"It would add immediately and substantially to the flow of critically needed scrap iron and steel. It would stimulate the sale of new machine tools. It would improve the efficiency of manufacturing throughout these United States."





FUNDAMENTALS OF

Forging Practice

General types of forge heating furnaces and temperature control equipment are described in this sixth part of the current series

FURNACES for forge heating must be capable of heating steel to the necessary temperatures for forging operations, and they must be able to maintain proper temperature at all times. They must be large enough to heat the forging stock as fast as it can be forged. They also must be designed and built so they do not cause too much scale on the hot forging stock. There are several general types of forge heating furnaces for general forging work and for production forging on the drop hammer, forging machine and forging press. Some of the different kinds of heating furnaces will be described and their general use indicated.

Majority of the furnaces for heating forging stock are fired either by fuel oil or by gas. Coal is used for forge heating in a few cases, but its use is limited. Even in the hand blacksmith shop, where the coal or coke forge was very common two or three decades ago, it is not being used very much. Small furnaces fired by gas or oil are employed. Use of either fuel oil or gas depends to a large extent upon which fuel is most available. Some localities have an abundance of natural gas which makes it economical to use. Other regions have a better supply of fuel oil. Various fuels are mentioned to show that they are used, but it is not important here to consider their relative merits. Various kinds of forge heating furnaces can operate on either type of fuel, if it is handled properly.

Batch Type Furnaces—Simplest and most used of the forge heating furnaces is the batch type, also called the box type. When it is used on small production forging, it is also termed the slot type. Shape of the unit is that of a rectangular box. For small sizes, the box is set up on legs to raise its height for suitable use. The box is built of high temperature fire brick kept in place by cast iron or steel plates. For general forging use at the smith hammer, there is a large opening at the front which is covered by a door, made of cast iron or heat resisting alloy iron and lined on the inside with fire brick. For use in the production forging plant with the drop hammers or forging machines, the front is walled in solid excepting for a long narrow slot across the hearth of the furnace.

Hearth, or floor of the furnace must be high enough

to make it easy to put forging stock into the furnace and to remove it when it has been heated. Where a door is used to close the furnace front, it is balanced by weights so that the door can be operated readily.

In large box furnaces, incorporating doors weighing many hundreds of pounds, they are often operated by electric motors or by air cylinders. Fuel is fed into burners where it is mixed with the correct amount of air for proper burning. The burners are mounted on the sides of the furnace or sometimes on the back, and throw the hot burning gases into the furnace. It is also necessary to provide suitable vent holes in the furnace through which gases can be exhausted. Fig. 46 shows a typical box type of forge furnace.

Slot type forge heating furnaces usually have an air pipe across the slot on the under side. This pipe has a series of small holes through which air is blown to protect the furnace operator from the hot gases coming out of the slot. Some slot type furnaces also have a protection shield across the front which protects the furnace tender from the terrific heat.

Small furnaces can be operated from one burner, the larger sizes may have two, three or four burners. Burners are set in such a position that the flames or hot gases are not directed at the metal being heated, but are directed over the work. The object is to circulate the hot gases so that all parts of the furnace have the same temperature.

Capacity of forge heating furnaces is based upon their ability to heat a given amount of steel or forging metal to a given temperature in a certain predetermined time.

Time usually given is based upon the weight of steel heated to temperature in an hour. Very small box type furnaces for hand work heat less than 100 pounds an hour to the normal forging temperature of 2200°F. From the small sizes, box type forge heating furnaces range in size up to about 2000 pounds per hour for the large size. Box type forge heating furnaces larger than the 2000-pound-per-hour size are usually special units that have been built for some particular purpose.

In heating forging stock by means of box or batch type furnace, the length of time for heating a given size of stock in a particular grade of material is dependent upon the heater carrying out the instructions.

If the individual is careless or forgetful, the piece may be underheated or overheated; for box type furnaces, good careful operators are necessary.

Rotary Forge Heating Furnaces — Rotary forge heating furnaces are designed with a rotating hearth on which the forging stock travels in a circle around the furnace. The simple, or open type of rotary forge heating furnace is open on the inside similar to a hat box. There is one opening in the circular side wall that is used for placing the forging stock on the hearth and for removing the heated stock from the furnace. It is built of firebrick similar to the box type furnace. A door is provided to close the opening when it is not in use. Temperature of the open type rotary forge heating furnace is practically uniform throughout the entire hearth area.

Purpose of the rotating hearth is to control length of time stock is heated. Usually, one complete rotation of the hearth means that the stock has been in the furnace the correct length of time for the particular size and grade of material. Speed of rotation is adjustable so the right speed for the steel can be used.

"Doughnut" type of furnace is similar in outside appearance to that of the open type. An inside circular wall is built in the closed or doughnut type so that the heating chamber is in the form of a circular tunnel. Two doors are provided, one for loading and

By WALDEMAR NAUJOKS

Fig. 46—Box type forge heating furnace

Fig. 47—Recording pyrometer for furnace shown in Fig. 46

Fig. 48—Heat-treat operator inspecting Micromax control of continuous forging-hardening furnace. Cribben & Sexton Co.

one for removing the forging stock. Doughnut type furnaces permit a lower temperature at the charging door; temperature in the circular tunnel increases gradually until it is up to the full temperature near the discharge door.

Reason for the gradual temperature is that many steels must be heated very slowly from room temperature through their critical temperature range, and the doughnut type of forge heating furnace is designed for this kind of service. Speed of rotation is adjusted to obtain the right amount of time to heat the forging stock so that it is heated uniformly throughout its cross-section area and is up to heat in the center as well as on the outside of the stock. Overheating is prevented. Size of stock and grade of material determine the heating cycle.

Straight Continuous Furnaces—Straight continuous forge heating furnaces, commonly known as "pusher" furnaces are the third type employed for forge heating.

The pusher forge heating furnace is long as compared to its width and height. Such furnaces range in length from about 15 feet for the small size to about 60 feet for the larger. Forging stock is pushed through the length of the furnace, being loaded into one end and taken out of the furnace at the other end.

The hearth may be one of two kinds. Some of the pusher furnaces have a flat hearth; forging stock is pushed through in rows. The stock must be square and the pieces placed side by side. For example, if the forging stock is 4 inches square and 12 inches long, a furnace 4 feet wide on the inside will have three rows pushed through. The pushing is done either by individual air cylinders or by hydraulic cylinders for each row, or by a bar across the charging end of the furnace, the bar being moved forward by a pair of rocker arms driven by a motor. Some pusher furnaces have a series of v-grooves in the hearth and the forging stock is pushed through the furnace with the stock end to end.

Part IV, July 19 issue, p. 100 and 102—Single caption for Figs. 32 and 33 should read "Progressive stages in forging aluminum airplane tail wheel housing." Fig. 34 caption should be "Progressive operations in making upper retracting link blank for aluminum aircraft landing gear." All three photographs were published courtesy Hydraulic Press Mfg. Co., Mt. Gilead, O.

Straight continuous furnaces can be designed to obtain a temperature gradient. For instance, the temperature of a pusher furnace of suitable length can be 1500° F at the charging end and 2300° F near the discharge zone. This is important in heating steels that must be brought to temperature carefully. Operating doors on the pusher furnaces are usually opened and closed by electric or air power. An electric eye has been used so that when tongs are moved towards the discharge door, the door of the pusher furnace opens automatically.

Rotary and the straight continuous furnaces can be built to handle any desired amount of steel for heating. Furnaces with heating capacities ranging from about 2000 pounds up to 10,000 pounds an hour are in regular use and larger furnaces can be built for desired applications.

Fig. 49—Induction heating furnace. Courtesy Ohio Crankshaft Co.

Temperature Control—For centuries it has been necessary for man to use his eyes to determine whether a piece of metal was heated to the temperature desired. As recently as a quarter century ago it was difficult to convince many skilled and highly practical people that it was possible to obtain improved temperature control through the use of temperature indicating control instruments. True, in the early days of such instruments they were considered laboratory toys, not suited for the rugged service in the shop. No one will dispute the fact that temperature recording and the temperature control instruments of today are highly efficient, and that they work to ranges infinitely closer than it is possible to gage with the eyes even in the "light of the full moon."

Pyrometers in use today are many in types and varieties. It is not necessary to go into detail as to how they operate and to the merits of various types.

It is desirable to know, however, what practical purpose some of them serve in the forge plant. The simplest instrument is the indicating type of pyrometer. It has a permanent position at the furnace or in the instrument room. The temperature in the furnace is "picked up" by a thermocouple or by an "electric eye" and is indicated on the dial face of the pyrometer. The instrument does not change or adjust the temperature in the furnace but merely shows the temperature. Any changing or adjusting must be done by hand.

Indicating and Recording Instruments—Next more elaborate instrument is one that indicates and adjusts the temperature. The operator or the metallurgist sets a sliding pointer to the temperature desired, and suitable mechanism in the instrument opens or closes the burner valves to keep the temperature in the furnace very close to the temperature for which the instrument has been set. A step further is the automatic controlling and recording instrument. In addition to holding the preset furnace temperature, the instrument records the temperature on an accompanying chart.

Some instruments use a round chart and others have the flat strip chart. Figs. 47 and 48 show the typical indicating and the recording pyrometer instruments.

Portable pyrometers for indicating temperatures are also used. Their purpose is to make periodical checks at the various furnaces to make sure that

Previous articles in the current forging series appeared in the following issues of STEEL: June 7, p. 100; June 21, p. 98; July 5, p. 76; July 19, p. 99; Aug. 2, p. 91.

the regular furnace instruments are working as they should be.

They are also used to check temperatures of forging stock during the forging operation to determine the temperature of the stock at the start of the forging operation and also the temperature at the end of the operation.

It is seen that on all types of forge heating furnaces the temperatures can be controlled very accurately. Two factors are important in heating metal for the forging operation. One is good temperature control which is obtained by the use of temperature control equipment. The second is the proper length of time in heating. Timing in the box type of forge heating furnace depends entirely upon the furnace operator.

Timing in the rotary forge heating furnace is set by the cycle of rotation which can be adjusted to suit the particular heating job. The straight continuous forge heating cycle is dependent upon the number of pieces put into the furnace in a given time, for a piece must be removed every time a piece of stock is put into the furnace. The operation of forge heating furnaces tends to improve the heating efficiency of the furnace and reduces fuel consumption where the furnaces are of the continuous types. They reduce the tendency towards getting overheated stock and insure uniform heating conditions in the furnace at all times.

Induction Heating—Induction heating is being used on a small scale for forge heating purposes. It is a radical departure from the conventional furnace type of forge heating and has interesting possibilities in the forging field.

At present, however, development is somewhat retarded because of the high cost of installation in shops already using furnace heating, and because of the need for special lines and wiring to accommodate the electrical power requirements. Induction heating of forging stock has many advantages, and it is certain that this method of heating will become more widely used in the future.

Installation of induction heating on a large scale in the presently existing forging plants would require considerable wiring to the induction units and would need special power lines from the source of electrical power. Cost of heating by the induction method appears to be somewhat higher than by oil or gas furnaces.

However, there are many real advantages to be considered for induction heating. The heating units take up little space in the forge shop. This is important where space is at a premium. Pieces are heated to their proper temperature without scale. This is highly important because forging scale is one of the causes of impression die wear. Die impressions are expensive; any improvement in the life of the die impression is highly desirable. Uniform heating of the forging stock is always positive and this tends to improve the forging conditions.

Smoky gases are eliminated from the forge shop. Excess shop heat is practically eliminated; this is highly desirable in the hot months of the year. Fig. 49 shows a typical induction heating unit for forge heating.

(To be continued)

TOOL & DIE MATERIALS

Their Selection, Application and Necessar

YEARS ago, any steel that could be used to produce cutting tools for either hand or machine use was classified as tool steel. Today, however, this does not hold true. Production of cutting tool and die materials is a highly specialized industry in itself. The phenomenal progress of this industry in general since the turn of the century has in no small measure been due to the metallurgical advancements which have been reflected in improved quality of steels and carbides used for all types of cutting tools and dies.

Originally produced in crucible furnaces, tool steels were mainly composed of iron, carbon, small amounts of manganese, silicon and other impurities. Subsequent development of alloy tool steels, especially the high speed type, reduced a serious obstacle to the efforts of production engineers by making it possible for toolmakers to meet a greater variety of specific production problems which they were heretofore unable to remedy.

Adoption of the electric furnace melting process for production of alloy tool steels has been an outstanding development in this young but progressive segment of the steel industry. Some alloy types, however, are still being produced by the open hearth process today.

Toolmaker the Key Man

In today's large production industries, the toolmaker is the key man upon whom the responsibility rests for obtaining and treating the necessary tools which will afford the highest quality production with attendant low tooling investment. This problem of selection is not an easy one as there are literally thousands of different tool steels available from hundreds of manufacturers, agents, jobbers and importers.

Tool steels may be grouped as follows: High speed steels, hot work steels, shock resisting steels, cold work steels, and carbon and low alloy steels.

High speed steels generally contain large amounts of tungsten or molybdenum, chromium and vanadium along with the carbon. In some analyses cobalt is alloyed. A high speed steel maintains its hardness under red-heat conditions generated in fast machining operations, being highly resistant to abrasion. While mostly used for cutting tools, it very often finds application for twist drills, reamers, milling cutters, fitting tools, gear cutters, lathes, planers and boring tools, broaches, woodworking tools and some types of long run punches and dies. Carbon tool steels are not recommended where operations involve the punching, shearing or forming of metals at comparatively high temperatures as they exhibit a tendency to soften and wash out in service.

Hot work steels, more applicable for use in the above conditions, are available and offer much longer life when subjected to combined heat, pressure and abrasion, having considerable resistance to shock. With relatively low carbon content, they usually contain alloying elements of tungsten, chromium, vanadium and/or molybdenum in varying amounts. This type is generally used for tools such as hot drawing and extrusion dies, shear blades, hot cut off tools, forging or gripper dies, hot heading punches, dummy blocks, crowners, gear shifts, bull dies, trimmer dies and forging die inserts.

Shock Resisting Steels Vary Considerably

Shock resisting tool steels are available for application where resistance to shock is most important with hardness and wear resistance considered secondary. Varying considerably in type and composition, these steels include a carbon vanadium type, a chrome molybdenum type, a tungsten chrome type, and a silicomanganese type, all of which afford excellent shock resistant qualities. They are particularly indicated for pneumatic tools such as chisels, rivet sets, rivet busters, backing-out punches and boiler makers' tools. These steels are also recommended for heavy duty shear and punch applications.

Cold work steels are especially recommended for tools and dies where both longer life and better nondeforming qualities than those offered with carbon tool steels, are desired. Materials included in this classification are the high carbon steels, high chrome steels, manganese oil hardening steels, and chrome-tungsten type steels. They are especially suitable for use in blanking, forming, coining and trimming dies, thread roller dies, bushings, cold forming rolls, gages, master tools, broaches and taps.

Comparison of Carbon Steels

Despite development of alloy tool steels, carbon tool steels still are very widely used by industry for many applications, being manufactured in a number of carbon ranges or tempers and in four different types. Known as water hardening tool steels, they offer the toolmaker characteristics of shallow hardening, medium hardening, medium-deep hardening, and deep hardening. Carbon ranges run from 0.70 to 1.35, the most commonly used of which is the 0.95 to 1.05, being suitable for general purpose work. The lower carbon ranges 0.70 to 0.90 are suitable for tools subject to shock, while higher carbons 1.10 to 1.30 are most suitable for cutting tools where edge keenness is sought. If a higher degree of hardness and greater depth of hardness penetration is desired than that offered by straight carbon steel, a small amount of chromium may be alloyed to impart desired characteristics to this so-called carbon chrome low alloy type, being especially suitable for cold work rolls, drawing dies in addition to drills, reamers and cutlery dies.

In the accompanying tabulation, an effort is made to provide the user with information arranged to facilitate the selection of the proper tool steel for the application desired. A user seeking a tool steel to perform a certain function merely scans the left hand column listing primary applications to find the application that comes closest to his requirements.

Once this is determined, the user's search can be narrowed down immediately by comparing the treatment and

...essary Treatment

Filling a long-standing need for complete information on cutting tool and die materials, this special compilation prepared by the editors of STEEL lists factors to be considered in the quick selection of tool steels and carbide types to meet any given requirement. Sources, trade names and applications are conveniently presented. Other pertinent data include chemical analyses, heat treatments, quenching media, movement in hardening and machinability as annealed

PART I

analyses of the various tool steels offered for that specific application by the companies listed.

Study Used As Adjunct

Although the tabulation is organized to ease the user's search for required tool steels, his final decision should not be made until after consulting the producer or producers offering the type of steel or steels that seem to come closest to his requirements. Information presented in this study should always be used as an adjunct to thorough consultation with representatives of the tool steel producers.

The problem of obtaining tool steels which afford best performance is not an easy one, and the toolmaker must consider the following three points in selecting and treating steel capable of giving maximum performance. First, it must be made by the best method known. Second, presuming the proper composition, it must be so worked and treated as to produce the best possible structure for its subsequent machining duty. Third, the tool steel producer's product must be of such uniformity that lot after lot will respond equally to the same treatment given it in the customer's tool room, and must in actual service give comparable results repeatedly. Tool steel blanks should be purchased from a maker producing high quality products and with an unquestionable reputation for uniformity both chemically and metallurgically.

Hardening Compared

Ability to water harden is the best-known characteristic of carbon tool steels. Due to the method of quench employed, this type will usually be found to have changed shape during treatment. Also, due to the enormous strain set up in the quench, susceptibility to cracking is greater than with the other types. Carbon tool steels are indicated when grinding allowance is available and where tool design avoids sharp corners or thin sections adjacent to thick sections.

It will usually be found that sections 1/2-in. or less in diameter will harden all the way through, while if larger than 1/2-in., a case and much softer core will result from heat treatment. Oil hardening steels will harden all the way through in large sections as compared to carbon tool steels which will usually reveal a core is sections larger than 1/2-in. The oil hardening type will show much less size changes due to slower cooling while in the oil and as a result less strain will be set up in sections involving corners or abrupt changes of section.

Air hardening steel, as a result of molybdenum additions, will utilize much slower quenching or cooling rates. Less intense strains will be set up in hardening with resultant diminuation in distortion. Air hardening steels, due to their higher alloy content, are more difficult to machine and necessitate use of an average higher hardening temperature. They are more difficult to grind after heat treatment, but offer greater abrasion resistance than the oil hardening type. After heat treatment, they reveal excellent hardness, size change and resistance-to-wear characteristics.

High speed steels, as their name indicates, permit greater cutting speeds than those offered by the other three types heretofore mentioned. High speed steels utilizing tungsten and/or molybdenum provide a material requiring very high hardening and tempering temperatures to bring forth their inherent hardness. They maintain and hold high hardness after tempering at 1050° F, which characteristic is necessary to withstand high frictional temperatures encountered in fast machining.

Stress Prevention

Preheating the steel prevents stresses caused by differential temperatures between case and core. The greater the size and alloy content of tool steel, the more necessary expert preheating practice becomes. However, preheating is not required or recommended unless quenching temperature is in excess of 1600° F or the piece is exceptionally large in cross section area and mass.

After preheating the work is raised to the recommended forging temperature, the rate becoming slower as tool size and alloy content increases. Soaking time, after the steel is uniformly heated, is also lengthened. In the table, forging temperatures are given as ranges, because correct temperature for any particular steel is higher when the section is large and demands subsequent heavy forging. Forging should cease when the steel cools to the finished forging temperature shown, due to the fact that the steel then loses plasticity and will not flow properly. To continue forging without reheating will invite subsequent cracking.

If normalizing temperature data are not available for the analysis being treated, the piece should be cooled slowly, after removal from the press, in mica, lime or other insulating material, to avoid excessive hardening, breaking and checking. The purpose of normalizing tool steels is to secure a refined and uniform grain structure after forging. In normalizing, heat should be well above the critical temperature followed by still air cooling with subsequent annealing.

For the relief of cold working strains, work should be heated to around 1250° F followed by either air or furnace cooling.

Annealing consists of thoroughly heating the steel to a predetermined temperature above the critical range for a specific period of time, then cooling slowly in the furnace.

Isothermal Annealing Suggested

Suggested annealing temperatures for the various grades of tool steel are shown in the accompanying tabulation. As a rule, the higher the alloy content, the more holding time required at annealing temperature and the slower the rate of furnace cooling. Packing material in suitable containers will reduce the tendency to scale and decarburize. To soften tools for reworking, isothermal annealing may

be utilized. This consists of heating to the annealing temperature for a specified period, cooling rapidly (usually in a molten bath) to below the critical, holding for 1 to 4 hours followed by cooling in air. Less time is consumed than in conventional annealing, with resultant hardness being slightly higher.

When hardening, in order to minimize warping and cracking, work should be slowly heated to 500 or 600° F then slowly raised to 1200—1300° F. Hardening demands a slow uniform heating to the proper temperature, a clean quenching bath of sufficient size, the correct type of quench with drawing or tempering being performed as soon as possible. Hardening furnace temperature should never be higher than that specified for the steel analysis. Heating must be slow and thoroughly uniform. The entire tool must be at the correct hardening temperature throughout before being quenched to eliminate warping, breaking and soft spots. Hardening troubles have often been attributed to too rapid heating operations.

Proper Quenching Necessary

Quenching baths must be clean and held at a uniform temperature. Water in the brine tank should be rendered free from surface oil, being held at 70—85° F. Oil heated to 125—180° F. for proper quenching, should not contain water in the bottom and should be changed if it becomes thick or sludged. Set rules regarding the quenching of tools are difficult to formulate as best practice is dependent upon size and shape of the particular piece. In general, a flat piece should be quenched edgewise, with the large flat surface being held perpendicular to the quenching bath surface. Agitation of the quenching bath or the tool itself will guarantee against steam pockets being formed against the material by entrapment of water or oil. As a general rule, work should be kept in the quench until it can be held in the bare hands while work is still submerged.

Improper grinding practice may spoil many tools even though made from the best steel and properly hardened and drawn. Too great a feed or too hard a wheel, or a wheel of improper grain size, may be the causative agent. Material should preferably be ground on a wet wheel with ample flow of fluid coolant being directed between the work and the wheel.

In hardening, operators frequently withdraw the steel from the bath and place in oil at the secession of vibration as warpage is often attributed to too rapid heating, improper quenching, quenching before the blank is uniformly heated throughout or by over retention of the work in the water bath.

Furnace Operation

Hardening furnaces should be constructed so that the flame never strikes material being treated. Gas or oil should burn beneath the hearth, with the combustion products being then channeled up the furnace side and out over the top, thus effecting radiation heating. The hearth should always be kept clean. Scale, which is iron oxide, if left in contact with hot steel will effect skin decarburization, thereby preventing maximum hardness upon quenching.

Proper pyrometric control is most necessary if heat treatment is to produce optimum results for the tool treater. Complete dependance upon the instrument is not suggested because at any given time temperature between the furnace and the work may vary several hundred degrees. Recommended practice is to employ two pyrometer fire ends or thermocouples—one beside the tool, the other at the side furnace wall—so as to give ample warning of too fast heating with its resultant disastrous warpage.

Cutting and forming of the extremely hard metals is being handled by the sintered carbides. Generally, they are considered mixtures of tantalum, titanium and tungsten mixed with other ingredients in varying proportions. Powdered cobalt acting as the cementing agent is combined with the above materials, the resultant mixture being pressed into hundreds of various tool shapes. Following this, the shapes are sintered to a diamond-like hardness. Other types of carbides utilize tungsten carbide and tantalum carbide which is imbedded into a soft metal such as nickel to form the various shapes used by the toolmaker and machinist. The pieces are either brazed or soldered to the steel tool shanks. Carbides afford excellent service where high-temperature conditions are encountered in machining operations. Typical carbide applications include: Production of components subject to heavy wear such as needle valves and cones, cam followers, drill jig bushings. Brinell testing hammers, bushings, valve tappets, various size balls and contact points; in addition to extrusion dies, percussion bits, swaging dies, form tools, wire rope dies, wire dies, master gage blocks, commutator saws, seaming rolls, counter sinks, mining drill and undercutter bits and rotary, burr, cylindrical and special disk files.

Applications Covered

Throughout the guide, whenever several steels are recommended for a specific application, it must not be inferred that any one is better suited than the others. A breakdown of the primary applications used in the study is presented in the box at the left. This will enable the user to narrow down the general application to best meet his specific problem.

In presenting the following tabular study, all tool and die steels are arranged in these categories: Water-hardening, oil hardening, air hardening and high speed. The cast alloys and carbides, while not considered tool steels in the strict sense of the word, are also included as types.

Breakdown of Primary Applications Tool Steels and Carbides

CUTTING TOOLS (Finishing)—Box turner—Forming—Shaving—Parting — Reaming — Boring — Counterboring—Broaching—Gear cutting — Threading — Milling — Planing — Filing — Scraping—Circular shearing—Hollow milling

SHOCK RESISTING (Repeated Impact)—Bearing — Riveting — Backing up—Burring—Caulking—Chisels—Hammers—Swaging

SHOCK RESISTING (Intermittent Impact)—Dowel pins—Drifts—Pilots—Screw driving—Tool shanks

COLD WORK DIES (Blanking)—Blanking—Lamination—Notching—Trimming

COLD WORK DIES (Cold Forming)—Nut and bolt—Heading—Crowning and crimping—Thread and form rolling—Bulldozer—Stamping—Notching—Burnishing—Drawing—Coining—Wire, rod and tube drawing—Extruding—Swaging—Knurling—Powder compression—Embossing-jewelry etc.—Bending

PUNCHING AND SHEARING—Railroad tie-plate punches and dies—Railroad tie-plate shear blades—Structural shape shear blades and punches—Perforating punches and dies

HOT WORK DIES (Hot punching and shearing)—Railroad tie-plate hot punching and shearing—Railroad splice bar hot punching and shearing—Hot billet, bar and plate shears—Hot trimmer dies—Hot punches

HOT WORK DIES (Hot Forming) — Forging die inserts — Hot gripper and header dies—Hot compression dies—Hot extrusion dies—Hot bending dies—Hot swaging dies

PLASTIC MOLDING DIES (Hubbed Cavity Dies)

PLASTIC MOLDING DIES (Machine Cut Gravity Dies)

PLASTIC MOLDING DIES (Hubs)

PLASTIC MOLDING DIES (Ejector Pins)

DIE CASTING DIES—Molds—Trimming dies—Ejector pins

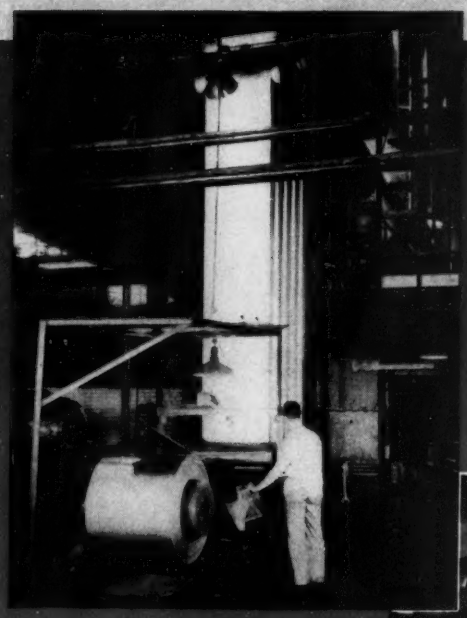
HIGH-STRESS AND HIGH-WEAR MACHINERY PARTS—Chuck jaws—Clutch pins—Collets and feed fingers—Clutch and chuck fingers—Quills—Stripper plates—Arbors—Drill bushings—Cams—Cam rolls—Centers—Mandrels—Spindles

GAGES — Plug — Ring—Snap—Thread plug—Thread ring—Best types of tool steels used for making gages are the manganese oil hardening, high carbon chrome, graphitic (oil hardening) and high speed.

Auxiliary Equipment and Machinery

Designed and Built by

MESTA

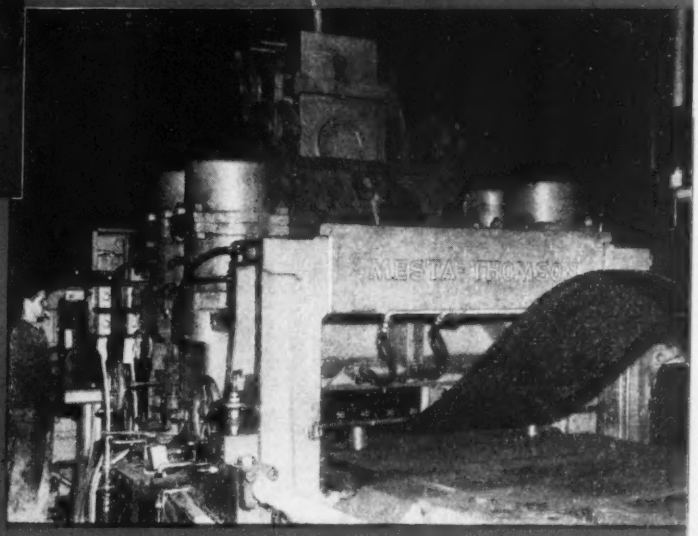


Discharge end of Mesta 42" Continuous Electrolytic Tin Plating Line

Battery of five 42" Mesta High-Speed Electrolytic Cleaning Lines

Group of Mesta 32" Patented Pickling Machines

Mesta 42" Tin Shearing Line, showing Mesta Patented Flying Shear and Leveller with Classifying and Piling Equipment



Mesta-Thomson Flash Welder Located at the Entry End of a Mesta Continuous Pickling Line

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PA.

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	

ADAMAS CARBIDE CORP., 40-30 23rd St., Long Island City 1, N. Y. — Listing No. 1

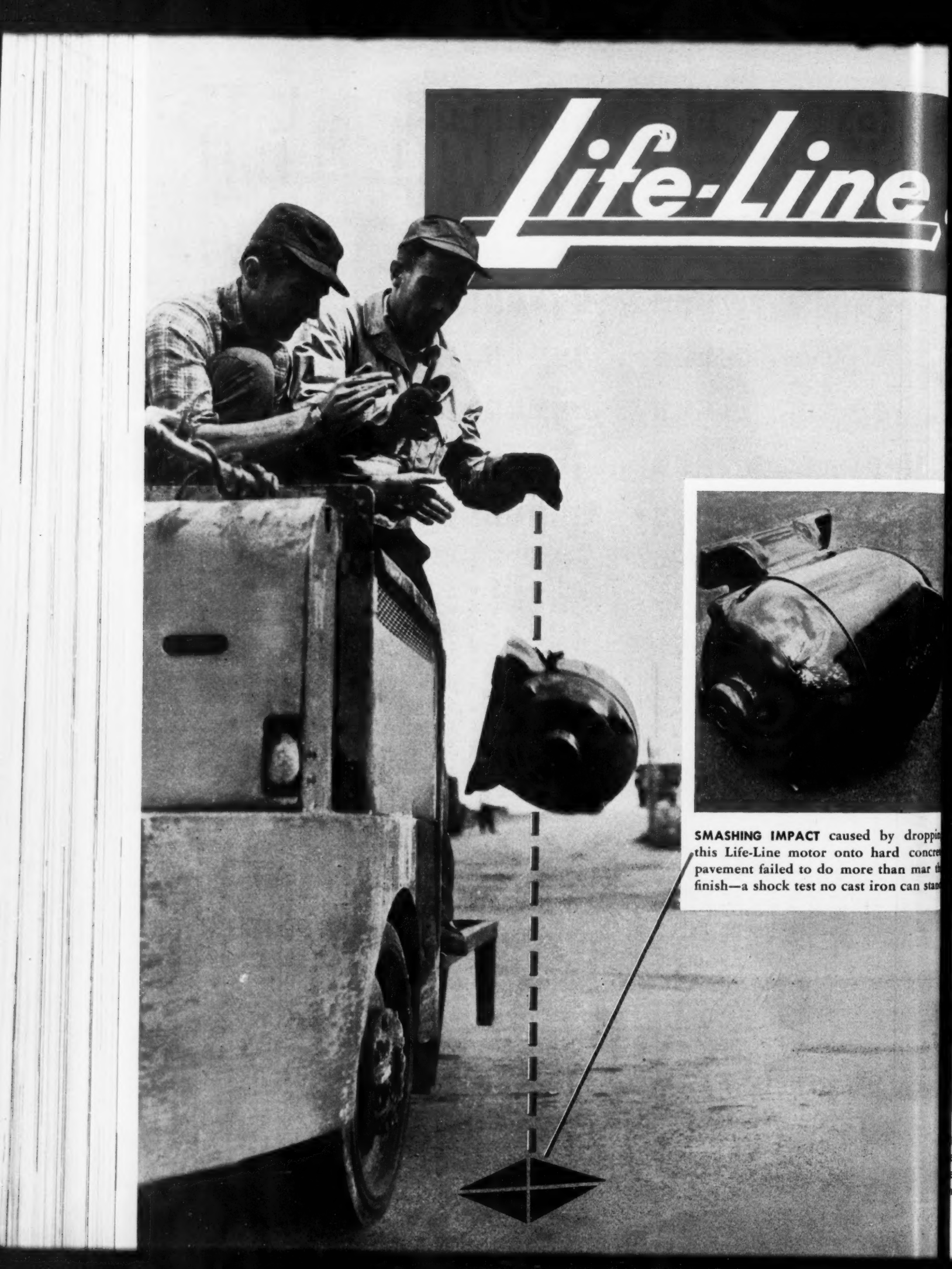
Cutting Tools (Finishing)	GRADE A, Carbide	Low cobalt content tungsten carbide
Cutting Tools (Finishing)	GRADE AA, Carbide	Low cobalt content tungsten carbide
Cutting Tools (Finishing)	GRADE CC, Carbide	Low cobalt content tungsten titanium carbide
Cutting Tools (General Purpose)	GRADE B, Carbide	Medium cobalt content tungsten carbide
Cutting Tools (General Purpose)	GRADE C, Carbide	Low cobalt content tungsten titanium carbide
Cutting Tools (Roughing)	GRADE BB, Carbide	Medium cobalt content tungsten carbide
Cutting Tools (Roughing)	GRADE D, Carbide	Medium cobalt content tungsten titanium carbide

★Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

ALLEGHENY LUDLUM STEEL CORP., H. W. Oliver Bldg., Pittsburgh 22, Pa. — Listing No. 2

Bushings	DUNKIRK EZ Oil Hardening	C 1.35, Mn 1.00, Cr .25, Mo .25, Si 1.35	1900–1950	1500	1450–1500	....	1475–1550	350–450	Oil Mach. 125 Movement +A
Bushings (Pneumatic, Air Gun)	LUDLUM 602 Water, Oil Hardening	C .50, Mn .70, Mo .40, V .10, Si 1.70	1700–1900	1400	1400–1450	1250	1500–1650	300–500	Water, Oil Mach. 85 Movement —C
Carbon Drills, Reamers	CROW Water Hardening	C 1.20, Mn .25, Cr .50, Si .25	1800–1900	1400	1400–	....	1475–1525	300–400	Water Mach. 100 Movement —C
Cold Forming Dies	CARMET CA-12, Carbide								
Cold Header Dies	CARMET CA-11, Carbide								
Cold Header Dies	CARMET CA-20, Carbide								
Cold Header Dies	POMPTON Water Hardening	Straight Carbon	1700–1900	1350–1400	1375–1450	....	1375–1500	300–500	Water Mach. 100 Movement —C
Cold Header Dies	PYTHON Water Hardening	C .90, Mn .30, V .25, Si .25	1700–1800	1400	1400–1450	....	1450–1550	300–600	Water Mach. 85 Movement —C
Cold Work (Dies, Rolls, Cams, etc.)	FCC Air Hardening Cast-to-Shape Air Hardening	C 1.50, Mn .40, Cr 12.00, Mo .80, V .50, Co .75, Si .40	....	.. .	1600	1400	1850	1000+ 750	Still Air Mach. 50 Nonshrink
Cold Work (Dies, Rolls, Cams, etc.)	FCC Air Hardening Forging Air Hardening	C 1.50, Mn .40, Cr 12.00, Mo .80, V .50, Co .75, Si .40	2100	1800	1600	1400	1850	1000+ 750	Still Air Mach. 50 Nonshrink
Cold Work (Dies, Rolls, etc.)	FCC ROLOY Cast-to-Shape Air Hardening	C 1.50, Mn .40, Cr 12.00, Mo 1.15, V .50, Co .75, Si .40	....	....	1600	1400	1850	1000+ 750	Still Air Mach. 50 Nonshrink
Cold Work (Dies, Rolls, Cams, etc.)	FCC 66 Cast-to-Shape Air Hardening	C 1.50, Mn .40, Cr 12.00, Mo .95, V .50, Co 3.25, Si .40	....	....	1600	1400	1850	1000+ 750	Still Air Mach. 50 Nonshrink
Cold Work (Dies, Rolls, Cams, etc.)	FCC 66 Forgings Air Hardening	C 1.50, Mn .40, Cr 12.00, Mo .95, V .50, Co 3.25, Si .40	2050	1800	1600	1400	1850	1000+ 750	Still Air Mach. 50 Nonshrink
Cold Work (Forming and Swaging Rolls)	FCC R3 Cast-to-Shape Oil Hardening	C .80, Mn .70, Cr 1.00, Mo .40, V .10, Si .35, Ni .45	....	....	1450	1300	1550	300–350	Oil Mach. 90 Movement B
Cold Work (Punch and Shock)	FCC 22 Forgings Oil Hardening	C .50, Mn .25, Cr 1.30, W 2.25, V .25, Si .30	2100	1500	1500	1450	1800	400–1100	Oil Mach. 85 Movement A
Cold Work (Tools, Dies, Rolls—up to 600°)	FCC 55 Cast-to-Shape Air Hardening	C 1.50, Mn .40, Cr 12.00, Mo .95, V .50, Co 2.00, Si .40	....	....	1600	1400	1850	1000+ 750	Still Air Mach. 50 Nonshrink
Cold Work Dies	AIRLOY Air Hardening	C 1.00, Mn 3.00, Cr 1.00, Mo 1.00, Si .25	2000	1500	1400	....	1450–1500	300–400	Air Mach. 60 Movement +A
Cold Work Dies (Blanking)	CARMET CA-21, Carbide								
Cold Work Dies (Blanking)	CARMET CA-22, Carbide								
Cold Work Dies (Blanking, Long Runs)	HURON Oil Hardening	C 2.00, Mn .25, Cr 12.00, V .80, Si .25	1900–2000	1650–1700	1600–1650	1250	1750–1800	350–900	Oil Mach. 45 Movement +A
Cold Work Dies (Blanking, Forming)	FCC Oil Hardening Cast-to-Shape Oil Hardening	C .90, Mn 1.15, Cr .50, W .50, V .25, Si .25	....	....	1400	1200	1450	400–500	Oil Mach. 90 Movement B
Cold Work Dies (Blanking, Forming)	FCC ROLOY #2 Cast-to-Shape Air Hardening	C 1.00, Mn .35, Cr 5.25, Mo 1.15, V .50, Si .35	....	....	1600	1400	1750	300–500	Air Mach. 65 Movement A
Cold Work Dies (Blanking, Forming)	UTICA Water, Oil Hardening	C 1.25, Mn .30, Cr .40, W 1.40, V .20, Si .35	1750–1900	1500	1500–1550	....	1550–1600	350–450	Oil, Water Mach. 65 Movement +A
Cold Work Dies (Blanking, Forming, Long Runs)	ONTARIO Oil, Air Hardening	C 1.50, Mn .35, Cr 12.00, Mo .80, V .25, Si .30	1900–2000	1600–1650	1600–1650	1250	1800–1850	350–900	Air, Oil Mach. 50 Movement +A
Cold Work Dies (Blanking, Forming, Short Runs)	DEWARD Oil Hardening	C .90, Mn 1.50, Mo .30, Si .25	1700–1800	1400	1375–1400	....	1400–1450	325–400	Oil Mach. 90 Movement +A
Cold Work Dies (Blanking, Forming, Short Runs)	SAGAMORE Oil, Air Hardening	C 1.00, Mn .50, Cr 5.00, Mo 1.00, V .25, Si .25	1800–2000	1500	1550–1600	1250	1700–1800	350–900	Air, Oil Mach. 65 Movement A
Cold Work Dies (Blanking, Forming, Short Runs)	SARATOGA Oil Hardening	C .90, Mn 1.20, Cr .50, W .50, Si .35	1700–1900	1450	1400–1450	....	1425–1500	325–400	Oil Mach. 85 Movement +A
Cold Work Dies (Inserts, Machine Parts)	FCC Cast Tool Steel	C .90, Mn .50, Si .30	....	....	1450	....	....	Should not be Hardened	Mach. 90

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
Cold Work Dies (Blanking, Forming, Short Runs)	SARATOGA Oil, Air Hardening	C .90, Mn 1.20, Cr .50, W .50, Si .35 V .25, Si .25	2000	....	1600	....	1800	900	Air, Oil Mach. 65 Movement A
Cold Work Dies (Blanking, Forming, Short Runs)	FCC Cast Tool Steel Oil Hardening	C .90, Mn 1.20, Cr .50, W .50, Si .35	1700–1900	1450	1400–1450	....	1425–1500	325–400	Oil Mach. 85 Movement +A
Cold Work Dies (Inserts, Machine Parts)	FCC Cast Tool Steel Oil Hardening	C .90, Mn .50, Si .30	....	....	1450	....	....	Should not be Hardened	Mach. 90
Cold Work Dies (and Machine Parts)	FCC FLAMHARD Cast-to-Shape Oil Hardening	C .50, Mn 1.15, Cr 1.20, Mo .40, V .10, Si .50	....	....	1500	....	1550	700–1200	Oil Mach. 85 Movement B
Cutting Tools (Finishing)	ALX Cast Alloy	C 2.00, Cr 33.00, W 17.00, Co 40.00							
Cutting Tools (Finishing—Cast Iron, Nonferrous, Nonmetallics)	CARMET CA-4 Carbide								
Cutting Tools (Finishing—Nonferrous, Nonmetallics)	CARMET CA-7 Carbide								
Cutting Tools (Finishing—Nonferrous, Nonmetallics)	CARMET CA-8 Carbide								
Cutting Tools (Finishing Steel)	CARMET CA-2, Carbide								
Cutting Tools (Heavy Rough Cuts—Cast Iron)	CARMET CA-10 Carbide								
Cutting Tools (Hot Trimming)	CARMET CA-9, Carbide								
Cutting Tools (Precision Finishing Steel)	CARMET CA-6, Carbide								
Cutting Tools (Roughing)	PANTHER SPECIAL High Speed	C .75, Mn .25, Cr 4.00, W 19.00, V 1.00, Co 5.00, Si .25	2000–2100	1600–1650	1600–1650	1500–1600	2375–2400	1050–1100	Oil, Air Mach. 45 Movement +A
Cutting Tools (Roughing)	SUPER DBL High Speed	C .80, Mn .40, Cr 4.00, W 5.50, Mo. 4.25, V 1.75, Co 7.75, Si .40	1950–2050	1650–1700	1600–1650	1500–1550	2225–2275	1025–1100	Oil, Air Mach. 45 Movement +A
Cutting Tools (Roughing)	SUPER PANTHER High Speed	C .80, Mn .25, Cr 4.00, W 19.00, Mo .75, V 2.00, Co 7.00, Si .25	2000–2100	1600–1650	1600–1650	1500–1600	2375–2400	1050–1100	Oil, Air Mach. 45 Movement +A
Cutting Tools (Roughing—Cast Iron, Nonferrous, Nonmetallics)	CARMET CA-3 Carbide								
Cutting Tools (Heavy Interrupted Roughing)	CARMET CA-5 Carbide								
Cutting Tools (Roughing Steel)	CARMET ACA-1, Carbide								
Cutting Tools (Roughing, Finishing)	DBL-2 High Speed	C .80, Mn .25, Cr 4.00, W 6.00, Mo 5.00, V 1.75, Si .30	1900–2100	1600	1550–1600	1500–1600	2150–2275	1000–1100	Oil, Air Mach. 55 Movement +A
Cutting Tools (Roughing, Finishing)	LMW High Speed	C .80, Mn .25, Cr 4.00, W 1.50, Mo 8.00, V 1.00, Si .30	1900–1950	1600	1550–1600	1500–1550	2175–2250	1000–1050	Oil Mach. 55 Movement +A
Cutting Tools (Roughing, Finishing)	LXX High Speed	C .70, Mn .25, Cr 4.00, W 18.00, V 1.00, Si .25	2000–2050	1600–1650	1600–1650	1500–1600	2200–2375	950–1100	Oil, Air Mach. 50 Movement +A
Cutting Tools (Roughing, Finishing)	ML High Speed	C .80, Mn .30, Cr 4.00, W 18.00, Mo .75, V 2.00, Si .30	2000–2050	1600	1600–1650	1500–1600	2350–2380	1025–1100	Oil, Air Mach. 45 Movement +A
Cutting Tools (Roughing, Finishing)	VLM High Speed	C .85, Mn .30, Cr 4.00, Mo 8.00, V 2.00, Si .30	1900–2000	1600	1550–1600	1500–1550	2150–2250	1000–1050	Oil Mach. 55 Movement +A
Die Casting Dies	FCC 6 Forgings Oil Hardening	C .37, Mn .80, Cr .95, V .17, Si .30	2200	1500	1600–Anneal 1700–Normalize		1600	800	Oil Mach. 85 Movement B
Die Casting Dies	FCC 5X1 Forgings Oil, Air Hardening	C .32, Mn .35, Cr 5.00, W 1.35, Mo 1.35, V .25, Si 1.05	2100	1600	1600	1400	1925	1000	Oil or Air Mach. 70 Movement B
Die Casting Dies	POTOMAC M Oil, Air Hardening	C .35, Mn .35, Si 1.10, Cr 5.25, Mo 1.25, V 1.00	1900–2100	1500	1550–1600	1300–1400	1850	1000	Oil, Air Mach. 10 Movement —A
Draw Dies	CROW (Listed Above) Water Hardening	C 1.20, Mn .25, Cr .50, Si .25	1800–1900	1400	1400–1450	....	1475–1525	300–400	Water Mach. 100 Movement C
Draw Dies	ONTARIO (Listed Above)								
Gages	CARMET CA-4 Carbide								
Gages	CARMET CA-8 Carbide								
Gages	DEWARD (Listed Above)								
Gages	ONTARIO (Listed Above)								
Gages & Machine Parts	FCC Oil Hardening Cast-to-Shape Oil Hardening	C .90 Mn 1.15, Cr .50, W .50, V .25, Si .25	....	....	1400	1200	1450	400–500	Oil Mach. 90 Movement B
General Purpose Carbon Tool Steel (Not subject to test)	CORINTH Water Hardening	Straight Carbon	1700–1900	1350–1400	1375–1450	....	1375–1500	300–500	Water Mach. 100 Movement —C
General Purpose Carbon Tool Steel	POMPTON (Listed Above)								
High Stress, High Wear Machire Parts & Hot Forming (Short Run)	FCC CMS Cast-to-Shape Oil Hardening	C .60, Mn .70, Cr 1.00, Mo .40, V .10, Si .40, Ni .45	... .	....	1475	....	1625	500–700	Oil Mach. 85 Movement B
Hot Work Dies (Forming, Piercing)	FCC TMS Cast-to-Shape Oil Hardening	C .50, Mn .55, Cr 1.55, V .10, Si .50, Ni 2.75	....	....	1425	....	1550	750–1000	Oil Mach. 50 Movement A



SMASHING IMPACT caused by droppi this Life-Line motor onto hard concre pavement failed to do more than mar t finish—a shock test no cast iron can stan

ERRIFIC PUNISHMENT PROVES STRENGTH F INDUSTRY'S NEW ALL-STEEL MOTOR!

er a quarter of a million now in service set best performance record in 58 years of manufacture

tors seldom have to withstand dropping onto con-e pavement—but they do meet constant stresses and xpected shocks on almost any job in industry.

he fact that Westinghouse Life-Line motors can hstand such extreme examples of abuse is one of the sons for the startling records of the more than a rter million Life-Lines now in service.

he performance record of these units has been six es better than that of any other motor design built by stinghouse in its 58 years of motor manufacture. ife-Line's heavy steel construction is one of the bene- that has come to industry out of war experience, en motors built for use on Naval vessels proved the ch greater shock resistance of steel over cast iron.

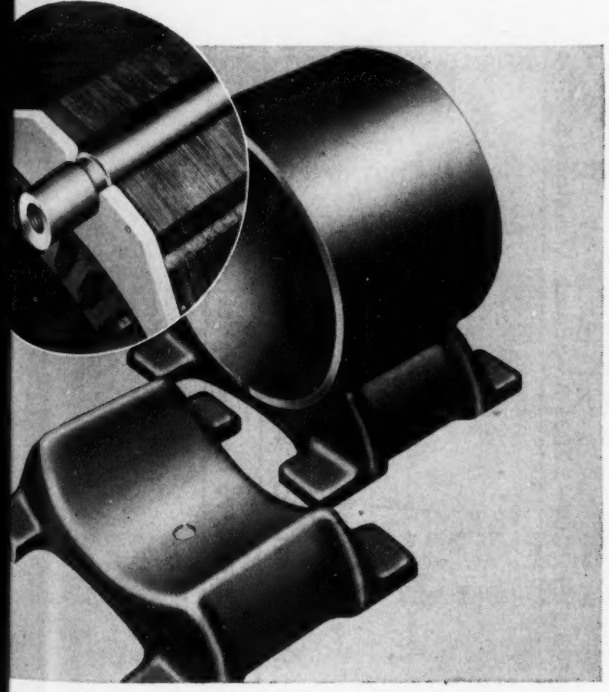
he heavy steel "barrel" frame and "bridge-truss" t construction has given the motor a rigid, yet resilient structure; at the same time, it has saved as much as 35% in space requirements over other methods of construction. The streamline of the Life-Line blends smoothly with modern machinery.

Get the full facts on Life-Line—its pre-lubricated bearings—its new electrical strength—and the reduced space and weight requirements—they're *all important* gains for your equipment.

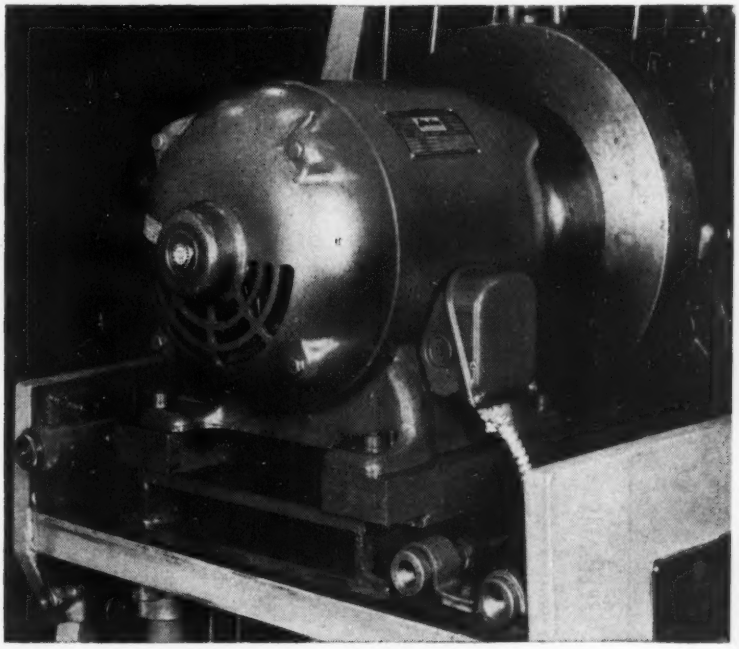
Immediate delivery on standard and near-standard Life-Line motors, from 1 to 15 hp, in dripproof, splash-proof and totally-enclosed types; short delivery available on the specials in these frame sizes. The Life-Line design is rapidly being carried through the larger sizes. Check your nearest Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21454

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Life-Line motors



EL STRENGTH starts with heavy rolled plate which forms -Line motor frame. Brackets and feet are heavy pressed el. Clamping bars and plates, bearing hubs and even duit boxes in Life-Line motors, are made of sturdy steel.



TOUGH JOBS—the shock loads of punch presses, drop hammers and other strenuous machine tool applications; these are places where Life-Line's greater resistance to shock means longer life and more trouble-free operation.

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
Hot Work Dies (Hot Forming)	ATLAS A — Oil, Air Hardening	C .30, Mn .30, Cr 3.00, W 9.00, V .50, Si .25	1950–2000	1500	1550–1600	1500	1950–2150	900–1250	Oil, Air Mach. 70 Movement +B
Hot Work Dies (Hot Forming)	ATLAS B — Oil, Air Hardening	C .40, Mn .30, Cr 3.00, W 11.50, V .50, Si .25	1950–2000	1500	1550–1600	1500	1950–2200	900–1250	Oil, Air Mach. 70 Movement +B
Hot Work Dies (Hot Forming)	FCC 5X1 Cast-to-Shape — Oil, Air Hardening	C .32, Mn .35, Cr 5.00, W 1.35, Mo 1.35, V .25, Si 1.05	....	....	1600	1400	1925	1000	Oil or Air Mach. 70 Movement B
Hot Work Dies (Hot Forming)	FCC 16B Cast-to-Shape — Oil, Air Hardening	C .65, Mn .55, Cr .90, Mo .80, V .10, Si .30, Ni 1.80	....	....	1425	800	1550–1625	750–1000	Oil, Air Mach. 85 Movement A
Hot Work Dies (Hot Forming)	POTOMAC — Oil, Air Hardening	C .32, Mn .30, Cr 5.00, W 1.25, Mo 1.50, V .25, Si .90	1900–2100	1500–1600	1500–1550	1400	1800–1950	900–1200	Oil, Air Mach. 70 Movement A
Hot Work Dies (Hot Forming Extrusion Liners)	FCC 5X1 Forgings	(Listed Above)							
Hot Work Dies (Hot Forming Extrusion Liners)	FCC 14 Forgings — Oil, Air Hardening	C .30, Mn .25, Cr 4.00, W 9.75, V .25, Si .20	2100	1500	1600	1500	2050	1050–1300	Oil or Air Mach. 70 Movement A
Hot Work Dies (Hot Punching)	SEMINOLE Medium — Oil Hardening	C .42, Mn .30, Cr 1.30, W 2.00, V .25, Si .25	1600–2000	1400–1450	1450–1525	1200	1650–1750	500–1200	Oil Mach. 85 Movement +B
Hot Work Dies (Hot Punching, Shearing)	EB ALLOY — Oil, Air Hardening	C .75, Mn .30, Cr 3.75, Mo .50, V .35, Si .25	1800–2000	1500	1500–1600	1400	1750–1900	900–1200	Oil, Air Mach. 75 Movement +B
Hot Work Dies (Hot Punching, Shearing)	MOHAWK — Oil, Air Hardening	C .45, Mn .30, Cr 3.50, W 14.00, V .70, Si .30	1950–2000	1600	1600–1650	1500	1950–2200	900–1300	Oil, Air Mach. 60 Movement +A
Machinery Parts	FCC Chrome Vanadium Cast-to-Shape — Oil Hardening	C .35, Mn .70, Cr 1.00, V .20, Si .30	....	....	1600	....	1650	350–500	Oil Mach. 90 Movement A
Plastic Mold Die Hubs	LUDLUM 602	(Listed Above)							
Shock Resisting	SEMINOLE HARD — Oil Hardening	C .52, Mn .30, Cr 1.30, W 2.00, V .25, Si .90	1600–2000	1400–1450	1450–1525	1250	1650–1800	300–500	Oil Mach. 85 Movement +B
Shock Resisting (Intermittent Impact)	ATLAS 93 — Oil Hardening	C .55, Mn .55, Cr .70, Mo .40, Si .20	1750–1950	1400	1425–1450	1250	1550–1650	350–600	Oil Mach. 90 Movement +B
Shock Resisting (Intermittent Impact)	LUDLUM 609 — Water, Oil Hardening	C .60, Mn .80, Cr .25, Mo .25, V .20, Si 2.00	1800–1950	1500	1425–1475	1250	1500–1650	300–500	Oil, Water Mach. 80 Movement —C
Shock Resisting (Intermittent Impact)	PYTHON	(Listed Above)							
Shock Resisting (Repeated Impacts)	LUDLUM 602	(Listed Above)							

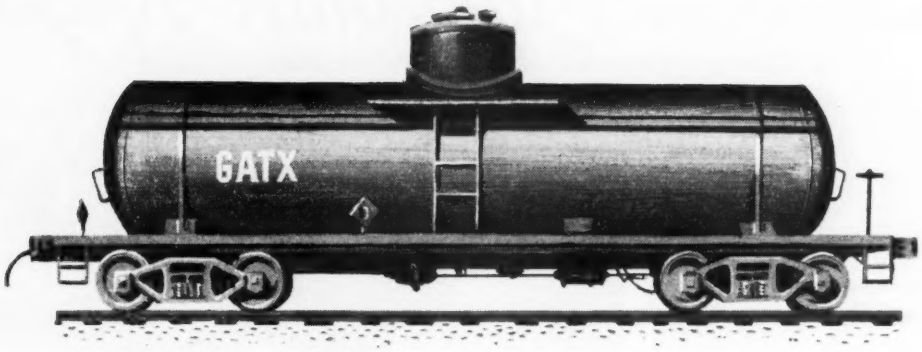
AMALGAMATED STEEL CORP., 7835 Broadway, Cleveland 5, Ohio — Listing No. 3

Dies, Tools	DYKROME — Air Hardening	C 1.50, Cr 11.50, Mo .75, V .25	2000	1700	1650	1300	1850	450–1000	Air
Dies, Tools	DYMAL — Oil Hardening	C .90, Mn 1.15, Cr .50, W .50	1900	1700	1400	1200	1475	300–475	Oil
Gages	DYMAL — Oil Hardening	(Listed Above)							
General Use—Tool Room	T.R.S. — Water, Oil Hardening	Special Analysis	2100	1600	1450	1200	1600	400–800	Water, Oil
Hot Work Dies	KOTUNG — Air Hardening	C .33, Cr 4.75, W 1.30, Mo 1.50, V .25, Si .90	2100	1600	1600	1300	1850	950–1150	Air
Punches, Dies, Slitters	KROPUNCH — Air Hardening	Special Analysis	2000	1700	1600	1300	1800	400–1000	Air

ANCHOR DRAWN STEEL CO., See Vanadium-Alloys Steel Co. (Listing No. 47)

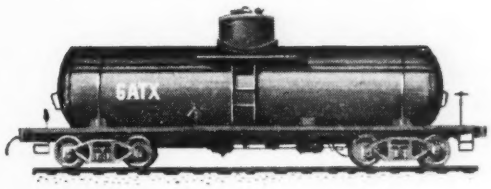
ATLANTIC STEEL CORP., 1775 Broadway, New York 19, N. Y. — Listing No. 4

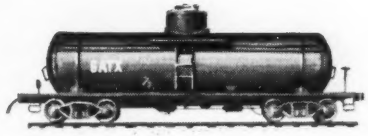
Cold Work (Blanking)	ATLAN — Oil Hardening	C .90, Mn 1.15, Cr .50, W .50	1900	....	1425	1150	1500	300	Oil
Cold Work (Blanking)	ATLANTIC DIE — Oil Hardening	C .70, Mn .40, Cr 1.00, Si .20, Ni 1.65	1850	....	1450	....	1500	400	Oil
Cold Work (Blanking)	ATLAN HCC — Oil and Air Hardening	C 1.50, Cr 12.00, Mo .80, V 1.00	1950	....	1650	1350	1800	300	Air or oil
Punching and Shearing	TUNCRO — Oil Hardening	C .50, Mn .25, Cr 1.40, W 2.00, V .25, Si .25	1850	...	1425	....	1700	250	Oil
Punching and Shearing	(See ATLANTIC DIE, ATLAN HCC, Listed Above)								
Shock Resisting	ATLANTIC 33	C .33, Mn .40, Cr .75, Mo .75, Cu .75, Si .65	1825 1975	...	....	....	1650 1800	... .	Water



General American

is filling the gaps in the tank car supply as rapidly as possible





The GATX fleet of more than 38,000 tank cars is growing . . . growing as fast as the still-limited supply of materials permits. When we can get additional materials for building more tank cars, we will use our expanded facilities to furnish *all* our customers with *all* the tank cars they need.

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EXPORT DEPT., 10 East 49th Street, New York 17, New York

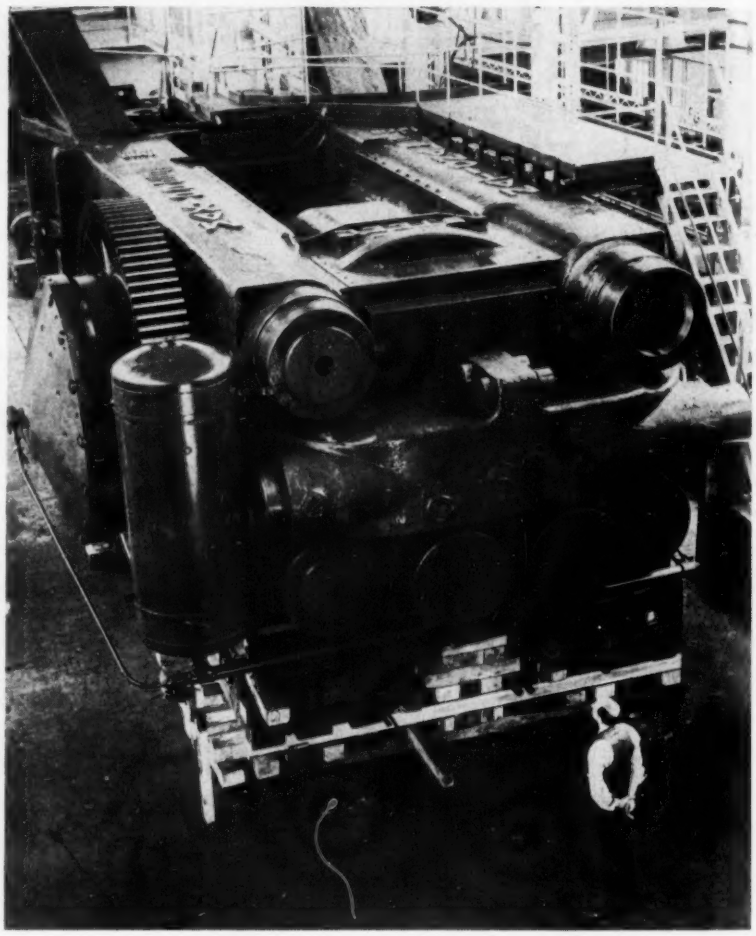
Automobile Crankshaft Forgings

...mass produced on 33-foot high press

CONSTRUCTION of a 1,600,000-pound mechanical forging press was recently completed by National Machinery Co., Tiffin, O. Designated as a Maxipress No. 10, it will be used for the mass production of automobile crankshaft forgings at Wyman-Gordon Products Co., Harvey, Ill.

Operating speed of the press is 40 strokes per minute and it is capable of producing in one blow in each die impression the size of work normally handled on a 12,000-pound steam hammer. As shown in the accompanying illustration, the 33-foot press was erected on its back to facilitate construction. Bed frame consists of four steel castings, largest weighing 237,000 pounds, which are rigidly held together by seven massive forged-steel preloaded tie rods. Each of the 32-foot vertical tie rods weighs 50,000 pounds and each of the four tie rod nuts scales 4640 pounds.

Press is also adaptable to the forging of many other large parts for railroad, oil field, earth moving and mining equipment which heretofore were not within the capacity of mechanical forging presses. Strength and rigidity of the press will hold work to extremely close tolerances with freedom from draft and with a minimum of flash.



Self-Propelled Crane Handles Hatch Covers

Removal and replacement of one piece steel hatch covers weighing approximately 8 tons each on the ore carrier, *S. S. John B. Cowle* is performed with a self-powered hatch cover gantry crane jointly designed and manufactured by Euclid Crane & Hoist Co., Euclid, O., and American Shipbuilding Co. Cleveland. In addition to its advantage during regular operations, the self powered crane makes it possible to handle these heavy covers during the winter layup period when ships power is unavailable.

Power to the crane motors is furnished from a diesel-driven direct current generator. Crane travel is by cable drive from a motor operated drum located on the crane thus completely overcoming the problem of traction on slippery or ice coated rails. The ship's sixteen hatch covers can be removed or put in place in less than 30 minutes.

Technical Bulletins Give Scale Information

Data, diagrams, selection advice and practical application information on dial scales are contained in a new series of technical bulletins published by Yale & Towne Mfg. Co., Philadelphia. One of the bulletins in the series is devoted wholly to the subject of counting scales equipped with ratio pans to adapt the scale to precise indication of numbers of parts handled in bulk.

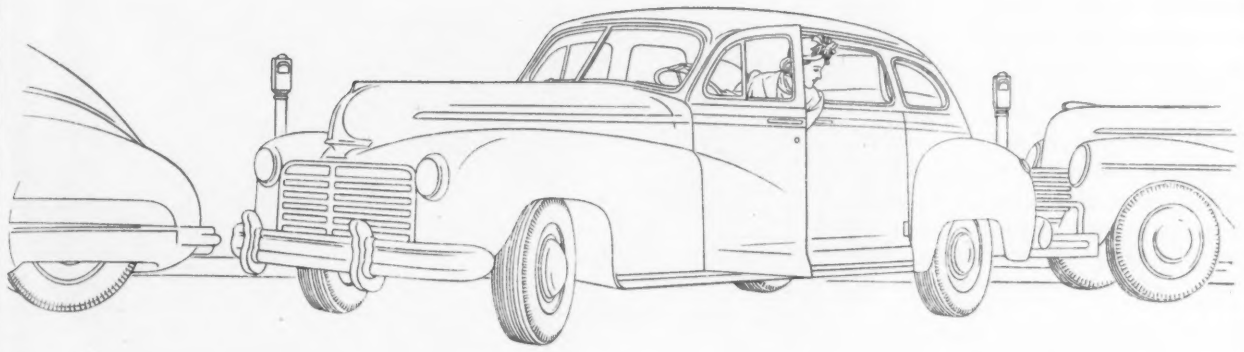
Bulletins on portable platform scales and bench scales emphasize proper selection of right model for right job. They also include photographic illustrations of many industrial uses of these types. Complete dimensional, capacity and shipping weight data on dormant platform scales on 242 different models in 6 classifications. Crane scale bulletin describes units suitable for loads up to 25 tons, both of the standard and close headroom variety.

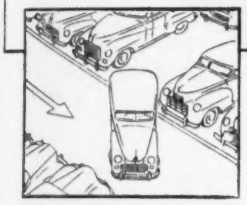
—o—

Advances in working comfort brought by adjustable aluminum office chairs are shown in a film produced by General Fireproofing Co., Youngstown, O. The movie shows that increased productivity rapidly absorbs cost of the chair which has a foam rubber seat in addition to an adjustable foam rubber back support.

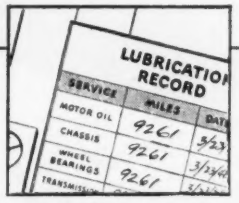
Anti-friction Steering Ease

with Torrington Needle Bearings



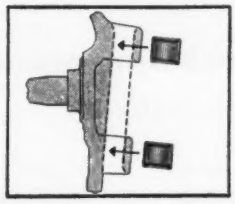


Parking is easier . . . for anti-friction Needle Bearings make wheels easier to turn, especially at slow speeds.



Long-lasting lubrication . . . because Needle Bearings are designed to "hold in" oil or grease . . . keep out dust and dirt.

Better Wheel Alignment is maintained . . . cutting tire wear and reducing service jobs—two economies for your equipment, too.



Cut-away View Shows how Needle Bearings mean compact, lightweight, high-capacity design in automotive kingpins.

NEW EASE AND FREEDOM in steering . . . savings in lubrication and maintenance . . . reduced wear and longer service life are provided by anti-friction Needle Bearings in kingpins of many of today's new cars. The compact design of these high-capacity units plus their efficient lubrication makes them ideal for bringing anti-friction performance to many points in automotive design.

Wherever wheels or shafts turn—in aircraft, farm machinery, machine tools, industrial equipment or home appliances—Needle Bearings bring advantages in operation and construction. The lightweight, unit design means easy fabrication and assembly . . . makes possible size and weight reductions in related elements.

Incorporate anti-friction Needle Bearing operation in equipment you design, build or use. The specialized experience of Torrington's engineers is at your service in finding the right solution to your friction problems. Call or write the nearest Torrington office.

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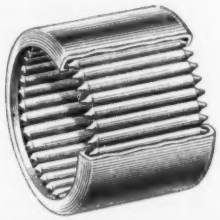
Torrington, Conn. • South Bend 21, Ind.
District Offices and Distributors in Principal Cities



TORRINGTON *NEEDLE* **BEARINGS**

NEEDLE • SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • BALL • NEEDLE ROLLERS

By J. H. EISAMAN
Supt. No. 2 Electric Furnace
Carnegie-Illinois Steel Corp., South Works
Chicago

Much has been said and written regarding the use of oxygen. Extravagent claims have been made, and ill-advised experiments have been undertaken which have tended to retard rather than promote its use. Experience of the author proves that proper application of oxygen is of sufficient advantage to justify its use

Electric Furnace Oxygen Utilization

...affords greater stainless scrap charge, reduced heat time and improved chromium recovery

USE of oxygen in electric furnaces has developed gradually through a period of years. Many electric furnace operators recall experiments with bottled oxygen as early as 1930. The high cost of oxygen, along with difficulties of maintaining a steady flow of a reasonably large volume, prevented extensive experimentation at that time.

With increasing demand for larger tonnages of stainless steels in the decade 1930 to 1940, producers of these steels accumulated increasing tonnages of stainless scrap. Economical recovery of the chromium in this scrap presented a very real challenge to the operators of electric furnaces.

Furnace Additions Created Problems — During this period, the usual method of stainless manufacture for the 0.8 per cent maximum carbon type consisted of charging ordinary carbon scrap and virgin nickel with iron ore or scale. After oxidizing to a sufficiently low carbon, carbon free ferro chromium was added for the entire chromium requirement. The 0.12 per cent maximum carbon grades were made, using approximately 30 to 40 per cent of the tapped weight as stainless scrap, and large quantities of iron ore or scale were added in the charge. Many problems arose with this practice, some of which are enumerated as follows:

1. Carbon was very difficult to reduce. Scrap had to be carefully prepared, and oily scrap and turnings were very objectionable because of resulting high carbon.
2. Reduction of the carbon content is a relatively high temperature reaction, but chromium reacts with ore and becomes oxidized at low temperatures and, consequently, large quantities of chromium were oxidized to chromic oxide during melt down.
3. Large slag volumes were common, and removal of this slag presented a problem.
4. Much chromium was lost in the slag, and percentage recovery of chromium from scrap was very low.
5. Long time heats resulted, which, in turn, adversely affected banks and bottom refractory life.

At about this time, large capacity liquid oxygen plants were being built, and the Dri-Ox systems were installed in most steel plants. This development did much to spur experiments with oxygen, since, for the first time,

Paper presented before American Iron & Steel Institute, New York, May 26-27, 1948.

a constant flow of a large volume of oxygen was available at a much cheaper price than bottled oxygen.

The South works management early realized the possibilities inherent in the use of oxygen in the electric furnaces. This policy resulted in a series of laboratory experiments with a 500 pound arc furnace. The knowledge, so derived, was used in experiments on 30-ton arc furnaces, all of which culminated in the "Chelius" patent for manufacture of stainless steels with oxygen.

At our plant oxygen is obtained, at the shop, from the plant Dri-Ox system through a 2¼-inch line at a line pressure of 120 pounds, which provides a maximum flow of approximately 15,000 cubic feet per hour per outlet.

Lance Does Not Penetrate Metal—After a series of experiments with various lance sizes, ½-inch was made standard, the size being the one which gave most rapid carbon reduction with maximum efficiency in oxygen use. Lances are common ½-inch washed pipe, covered with patching (ground firebrick and ganister) and wrapped with cotton tape to hold the patching intact. The finished lance is not dried before placing in the furnace, since the heat of the furnace dries it sufficiently as it is being used. A lance prepared in this manner lasts approximately 2 hours. Lances are placed through wicket holes in the doors, with the end of the lance through the slag, but not into the metal. By so doing, the oxygen flowing from the lance impinges on the metal at the slag-metal interface.

Our experience has indicated the foregoing method to be the most satisfactory and economical under prevailing conditions, although a great deal of controversy exists between operating people, many of whom prefer to immerse the lance.

In some shops, rate of input and also rate of carbon reduction are far faster than can be justified at South works at this time, not only from an oxygen efficiency viewpoint, but also from the observation that extremely fast carbon reduction tends to produce a melt that is very difficult to control. With respect to large furnaces, it seems at this time that, from an overall viewpoint of the efficiency of oxygen use, refractory life and control of the bath, extremely high rates of oxygen input are possibly not the most economical in the long run.

Experiments are being conducted at various plants to determine if the use of oxygen assists in the melting of scrap. At our works the few attempts in this direction gave no apparent saving in either time or power.

TABLE I—STAINLESS 0.12 PER CENT MAX. CARBON

Average heat size:	83.2 tons tapped 78.9 tons ingots
Chromium Recovery (from stainless scrap)	88.3 per cent
Average melt carbon	0.163 per cent
Average carbon reduced	0.100 per cent
Average oxygen used (per ton)	163.9 cu. ft.
Average power consumption (per ton)	449 Kwhr (tapped tons)
Average power consumption (per ton)	474 Kwhr (ingot tons)
Average heat time tap to tap	11.51 hrs.
Average heat time power to tap	9.43 hrs.
Tons per operating hour	7.23 tons
Tons per furnace hour	8.81 tons

TABLE II—ALLOY STEELS

Average heat weight (ingots)	44.7 tons
Tap to tap	7.48 hrs.
Power on to tap	6.07 hrs.
Tons/operating hour	5.98 tons
Tons/furnace hour	7.27 tons
Kwhr/ton	527.0
Carbon reduced	0.274 per cent
Time for carbon reduction	48.0 Min
Cu. ft. oxygen	164.0 per ton
Manganese residual	0.262 per cent

TABLE III—SINGLE SLAG ALLOYS

Average heat weight (ingots)	45.6 tons
Tap to tap	6.21 hrs.
Power on to tap	5.01 hrs.
Tons/operating hour	7.32 tons
Tons/furnace hour	9.16 tons
Kwhr/ton	484.0
Carbon reduction per heat	0.135 per cent
Time for carbon reduction	20.8 Min.
Cu. ft. oxygen per ton	68.0
Manganese residual	0.323 per cent

TABLE IV—SINGLE-SLAG RIM STEELS

Average heat weight (ingots)	75.5 tons
Tap to tap	7.4 hrs.
Power on to tap	6.1 hrs.
Tons/operating hour	10.2 tons
Tons/furnace hour	12.1 tons
Kwhr/ton	488.0
Carbon reduced per heat	0.13 per cent
Time for carbon reduction per heat	26.0 Min.
Cu. ft. oxygen per ton	58.5 cu. ft.
Manganese residual	0.223 per cent
FeO of tapping slags	28.0

Electric furnace steels may be classified arbitrarily into four groups:

1. Stainless.
2. Electric type carbon and alloy (two slag).
3. Single slag alloys (similar to open hearth quality).
4. Single slag carbon (similar to open hearth quality).

Stainless steels were produced originally in relatively small furnaces. As tonnage requirements increased, and when it became desirable to produce larger ingots to make wider sheets and plates, larger furnaces were used. Then the effect of the disadvantages previously enumerated for the use of ore or scale became increasingly serious.

A recent run of forty-four consecutive heats was made on a type 70 Heroult furnace, making 0.12 per cent maximum carbon with approximately 18.00 per cent chromium, 9.00 per cent nickel stainless heats.

Light Scrap Bundles Require Additional Recharge — Table I shows pertinent operating data, both on the basis of tons of metal tapped and tons of ingots produced. The figures are averages as taken from logs of the heats and it was assumed that the stainless scrap contained 18.00 per cent chromium. Nickel oxide or nickel sinter was charged with the scrap. Most of the stainless scrap was light bundled sheet which necessitated at least one recharge.

Other recent runs in a furnace of the same size have been made, including many heats of 0.08 and 0.07 per cent maximum carbon. Stainless scrap charged in these heats was approximately 50 per cent on the basis of tapped weight. Average chromium recovery from the scrap was 78 per cent. Approximately 350 cubic feet of oxygn per ton was used.

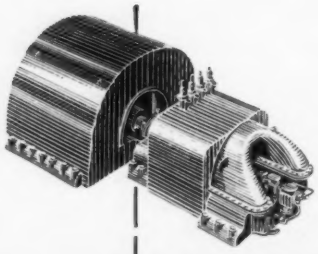
From our experience, the performance, as indicated in Table I, could not possibly be equalled by obtaining carbon reduction with ore or scale.

Advantages of using oxygen in stainless manufacture are:

1. High percentage of stainless steel scrap may be used.
2. High percentage of recovery of chromium from the scrap can be obtained.
3. Kilowatt hours per ton are lowered since the oxygen-chromium reaction is exothermic, thus providing additional heat.
4. Tons per hour are increased.
5. Materials handling costs are lowered, since no ore is required, and since there is less waste slag to be handled.
6. Due to the high residual chromium in the bath, less off heats because of chromium content occur, since errors in either weighing or sampling of the bath are relatively of less importance when adding chromium to a bath with a 12.00 per cent residual to meet an 18.00 per cent specification than with a low residual chromium bath.
7. Less off quality heats occur in the straight chromium grades. These grades are subject to conditions known as "back up" or gaseous ingots, which result in large rejections. This condition is brought about by the metal, as tapped, containing excessive amounts of gases, the worst of which is believed to be hydrogen. If a good oxygen "blow" is used, the gas content of the bath is lowered. The "back up" condition has not been observed at South works in heats which have had normal carbon reduction with oxygen.

Major tonnages of electric furnace steels fall into the normal American Iron & Steel Institute types, and oxygen is being used to a considerable extent in the manufacture of these steels.

Some years back normal practice was to melt to the low side of the car-



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bon specification, with little or no oxidization, in an effort to obtain maximum alloy recovery from scrap. It became increasingly evident that the bath had to be oxidized to obtain clean, sound steel. It then became common practice to melt above the carbon specified. Ore was added when the charge or additions of ore were made when the bath was melted in order to produce a good boil.

Our current practice consists of charging sufficient coke to melt about 0.20 to 0.30 per cent carbon above specification. If available, 80 per cent of the charge is alloy scrap.

When melting alloy steel, as soon as the heat is sufficiently melted to obtain a test, oxygen is added and the carbon reduced sufficiently below specification to permit use of high carbon ferro-alloys.

Table II shows the results of 515 recent heats of alloy steel made in this manner. Standard AISI types of all carbon ranges are included.

Lower Hydrogen Associated with Cleaner Steels — Before considering the advantages of oxygen in making AISI steels, it might be well to consider the ill effects of hydrogen. Several things are known definitely. For example, it has long been the practice to dry all additions to electric furnace heats to prevent hydrogen pickup from moisture, which was thought to produce unsound steel. It has been known for some time that hydrogen tends to accentuate the "flaking" problem, and steels with considerable hydrogen have to be "slow-cooled" more carefully after rolling to prevent flake formation. The casting industry has known for a long time that an active boil in their furnaces was a means of lowering hydrogen and assisted in the production of sound castings. Effects of hydrogen on the nonmetallic inclusion content is not so well known, but there are indications that lower hydrogen is associated with cleaner steels.

Iron ore carries considerable moisture, some of which, as water of constitution, cannot be removed with normal drying. In the manufacture of quality steels, it does not seem proper to add a material which may cause so much harm if not properly handled. Dr. Sims, of Battelle Memorial Institute, in his work on gases in electric furnaces, gave a report of progress before the Fifth Annual Electric Furnace Conference. His work showed an increase of hydrogen in the bath each time an addition of ore was made. While it is true that with an active boil, hydrogen was eliminated, small deviations from good

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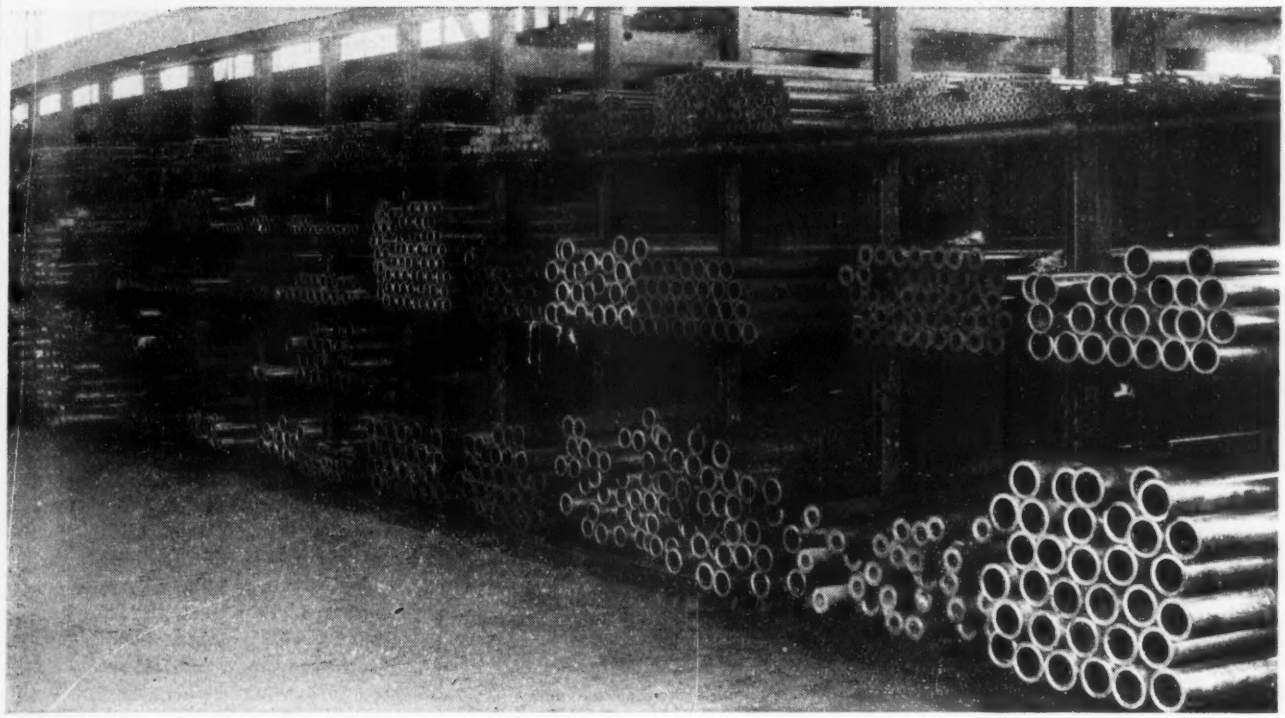

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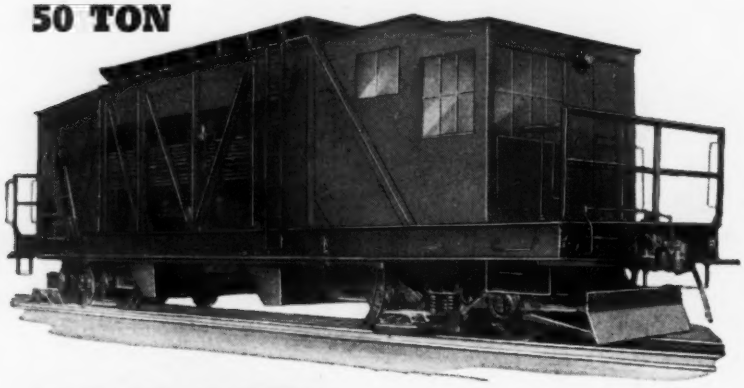

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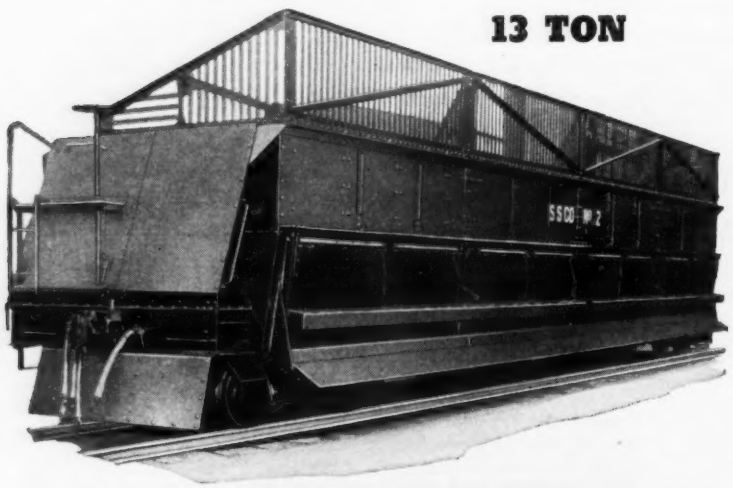

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steelmaking practice, such as a short boil or insufficient temperature, may leave a hydrogen content sufficiently high to cause trouble.

Oxygen Effects Low Hydrogen Content — Carbon reduction by oxygen seems to be a more reliable method of obtaining low hydrogen content in steel, because of decreased introduction of hydrogen and the purging action of oxygen.

Advantages of using oxygen in the manufacture of AISI standard electric furnace steels are as follows:

1. Rapid carbon reduction, with resulting faster heats.
2. More positive oxidation.
3. Less off-quality heats.
4. Higher residual manganese and chromium.

The practice at South works on these steels consists of charging 80 per cent alloy scrap, if available, ordinary carbon scrap and sufficient coke for the bat to melt theoretically 0.15 to 0.20 per cent over the carbon specified. Enough burned lime is charged to produce a lime-silica ratio of three. When melted, a test is taken and oxidization is begun with oxygen. When carbon is low enough to allow for high carbon ferro-alloy additions, the heat is blocked with aluminum, another test is taken, and when final analysis is obtained, additions are made and the heat is tapped. Table III shows results of 225 recent heats made by the single slag practice.

Data in Tables II and III for alloy steels show a relatively long heat-time. These times of heats are somewhat influenced by the fact that when shop delays occur, the larger furnaces in the shop are favored, whenever possible, at the expense of this smaller furnace.

During the present shortage of open hearth steels, Considerable electric furnace capacity available has resulted in the production of rather large tonnages of single slag carbon steels in electric furnace, particularly of the rimming type. Table IV shows some of the data from operation of the electric furnaces at South works. These data were obtained from the logs of 1150 heats of rimming type steels, ranging from 0.05 to 0.08 per cent carbon specification to 0.20 to 0.25 per cent carbon specification.

Heats from which data in Table IV were obtained were made using oxygen as the only oxidizing agent.

Use of oxygen presents the following advantages in the rimming type steels in addition to the advantage of less materials handling:

1. Rapid carbon reduction which results in fast heats.
2. Positive rimming action as the re-

sult of adding oxygen for a few minutes if the slag FeO content is not sufficiently high just before tap.

3. Good control of carbon analysis, since the carbon can be caught on the way down because of the constant rate of carbon drop.
4. Good control of manganese analysis because residual manganese is rather high.

Normally the scrap charged in the rimming heats is of such a physical form that the original charge and two recharges are sufficient to get the required amount of scrap into the furnace. Enough burned lime is added with both the original charge and the recharge to maintain a lime-silica ratio of about three. Bottom and bank maintenance on this grade is very slight.

Identification of Unknown Materials Made Easier

Broad, new fields of application for x-ray diffraction in the identification and quantitative analysis of unknown materials are opened by a high-precision, high-output machine revealed for the first time recently by General Electric X-Ray Corp., Milwaukee.

The unit, with its many attachments, was shown in exhibit, and described in two papers read before the International Congress of Crystallography held in Cambridge, Mass., July 28 to Aug. 3 at the Harvard University department of mineralogy.

One attachment, the fluorescent analyzer, greatly extends the range of composition of materials which can be analyzed, in comparison with that possible when using optical spectrometers.

Another group of attachments, which make possible the direct recording of x-ray intensities on a continuous strip of chart paper, save countless hours of laboratory time by revealing both the angular placement of the characteristic lines of materials and their relative intensities.

The new unit couples, for the first time, precision control of x-ray output with high x-ray intensity. X-ray intensity of the unit is controllable and reproducible to an overall accuracy of 0.5 per cent. The accuracy is accomplished by controlling the x-ray tube voltage to within 0.1 per cent and the tube current to within 0.2 per cent.

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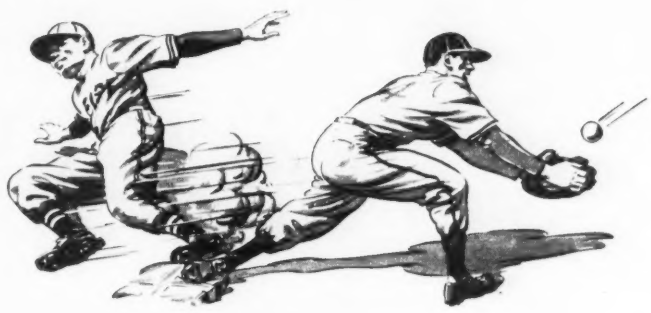

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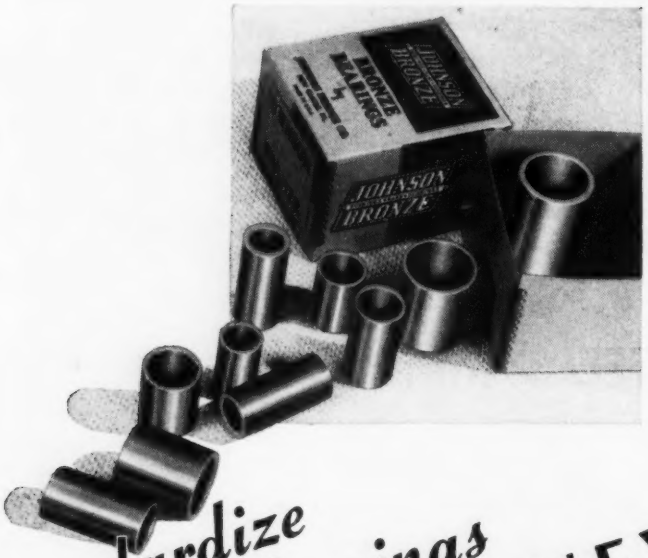

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International Congress of Crystallography, at which the unit was shown, celebrated the adherence of the American Society for X-Ray and Electron Diffraction, and the Crystallographic Society of America to the International Crystallographic Union.

Nylon-Covered Wire Rope Being Produced

Nylon-covered wire rope production has been started by Rochester Ropes Inc., Culpeper, Va. According to the manufacturer, it will lengthen the life and increase usefulness of steel cables in many services where wire rope is already used.

Manufacture of the product designated as Wirelon will be in diameters ranging from 1/32 to 1 inch or larger. Coating is unaffected by oils, cleansing agents, marine growths and all alkalies. It is not harmed by acids such as nitric, hydrochloric or sulphuric in concentrations up to approximately 1 per cent. The ropes which retain their flexibility whether wet or dry operate well at high and low temperatures.

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—o—

All of the technical information necessary to make illumination calculations either by the lumen or the point by point method is contained in a pocket size Calcu-light-or recently developed by Westinghouse Electric Corp., Pittsburgh. No additional tables or charts are needed for lumen method calculations. A distribution curve is required for point by point calculations.

New Books

Production Problems Detailed with Solutions

Work Routing, Scheduling and Dispatching in Production, by John Younger and Joseph Geschelin, Third Edition; cloth, 168 pages, 6¼ x 9½-inches; published by Ronald Press Co., New York, for $3.50.

Written to aid production men in their task of getting the job under way smoothly and on time, through the proper channels of operation and closed out on schedule, this book concentrates attention of the objective of getting the work out rather than running the gamut of preparing, material control, collecting of cost data and other ramifications of a complete production control system. Factors with which the production man is directly concerned in deciding on operations, setting up job time tables and following through to completion in time to meet established delivery dates are included.

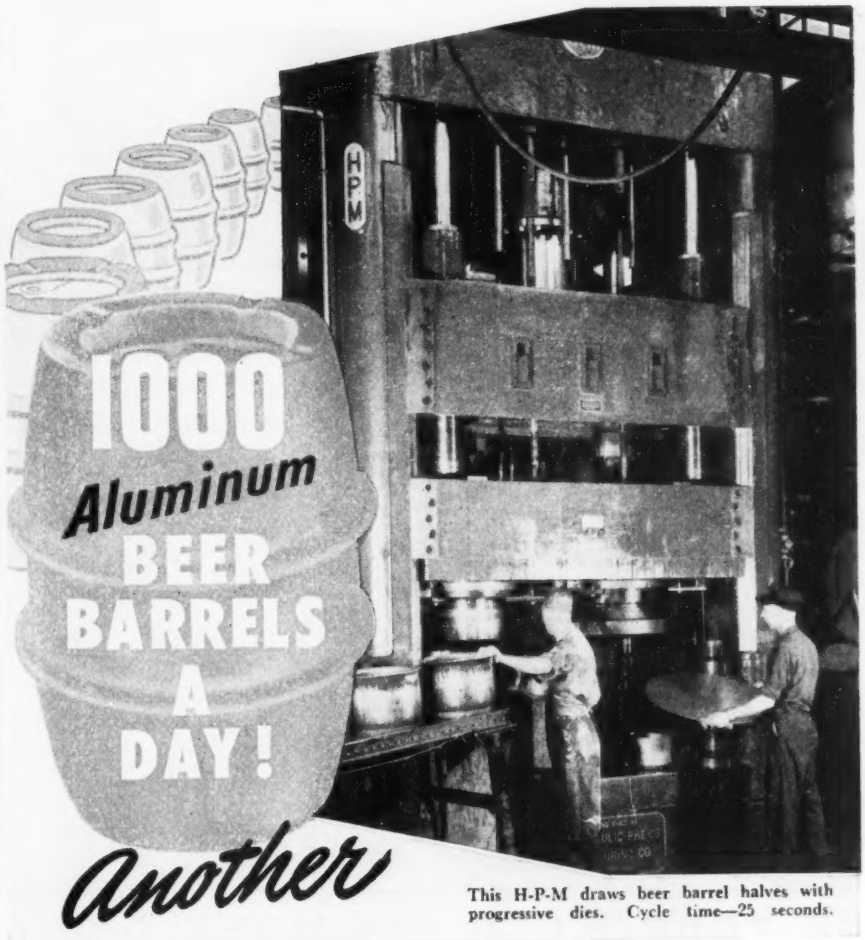
This third edition represents practically an entire rewriting to bring the book up to date. Among the latest features are the new case studies on mass production and the descriptions of the new "process" machine method with master electric controls. Liberal use of charts, graphs and photographs is made. At the end of each chapter are several problems relating to material in that chapter.

Book Covers Various Metallurgical Processes

Metal Process Engineering, by Norman E. Woldman, Ph. D.; cloth, 291 pages, 6¼ x 9¼-inches; published by Reinhold Publishing Corp., New York, for $5.

Author has attempted to meet a demand for a short, yet thorough treatise on practical phases of metallurgical engineering and metallurgical processes. He has made free use of manufacturers' literature, standard books and catalogs to obtain much of the information contained in the book. Liberal use has been made of photographs of machinery, parts, processes, etc., photomicrographs, charts, tables and sketches.

Each of the 10 chapters in the book is broken down into subheads, each on a particular phase of the subject covered in that chapter. The casting chapter, for instance, is broken down into the following subjects: Melting equipment, sand castings, plaster or cement mold castings, permanent mold castings, die



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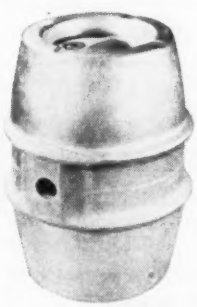

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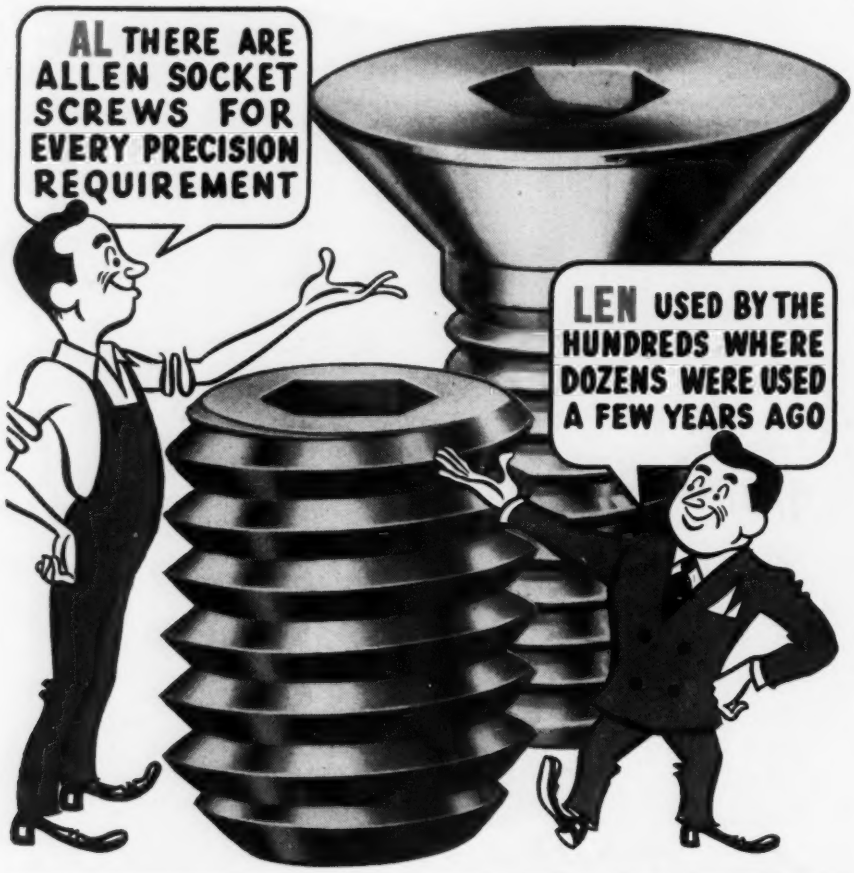
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Aluminum Alloy Analytical Methods Described

Analytical Methods for Aluminum Alloys, compiled and published by Aluminum Research Institute, Chicago; flexible cover, ringed pages; 6 x 8¾-inches; 103 pages.

The greatly increased use of aluminum, the development of new analytical tools and the demand for high degrees of accuracy and speed in analysis are the reasons for the publishing of this book, intended as a guide for laboratories. Methods contained in the book have been thoroughly proved and tested in laboratories of institute members.

Division of the book are: Sampling of Aluminum Casting Alloys; Chemical Methods; Instrumental Methods (Photometric and Spectrographic). In the chemical methods and photometric methods sections are the procedures for the determination of various methods by established technique. Wave length tables are included for use with spectrographic methods.

Heat Treatment of Steel Covered in Two Volumes

Steel and Its Heat Treatment, by D. K. Bullens and Metallurgical Staff of Battelle Memorial Institute (Fifth Edition). In two volumes, cloth, 489 and 293 pages, 262 and 118 figures, 5⅞ x 9 inches. Published by John Wiley & Sons Inc., New York, $6 and $4.

Volume I explains the principles behind heat treatment of both carbon and alloy steel. It stresses the definitions and terminology necessary for understanding the subject. The uses and limitations of tests to evaluate suitability of steel for heat treatment and to determine proper engineering uses for heat treated products are dealt with. Well explained charts and diagrams supplement the text. This volume is divided into four sections: Terminology; Testing; Heat Treatment in the Pearlitic Domain, Below the Critical Range; and Heat Treatment Involving Transformation of Austenite.

The second volume gives the practical applications of the principles covered in Volume I—Tools, Processes, Control. Furnaces, quenching

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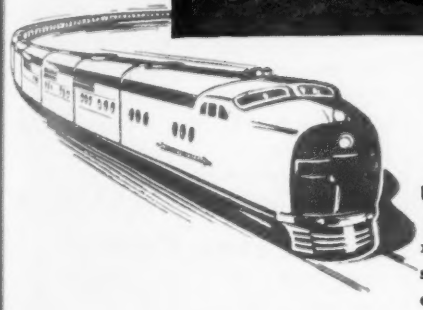

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Wapakoneta
SHEAR BLADES
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Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.
TOOL
Rx ENGINEERED TO THE JOB
Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.
The WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
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media and other tools are discussed and photographs shown of installations in operation. How to use the principles and a warning of the penalties which follow disobedience of them is covered. Methods of preventing cracking and distortion, preparation of steel for machining, the relation of heat treatment to welding and heat treatment of steel casting, malleable iron and cast iron are detailed. Sections of Volume II are: Control of Surface Conditions; Heating and Cooling; Heat Treatment of Ferrous Castings; Other Applications of Heat Treatment.

Volume III—Engineering and Special Purpose Steels, a discussion of engineering carbon, simple alloy and complex alloy and special purpose steels, is in preparation.

Reference Book Furthers Electronic Understanding

The Industrial Electronics Reference Book, prepared by electronics and research engineers of Westinghouse Electric Corp.; cloth, 680 pages, 9 x 11 inches; published by John Wiley & Sons, New York, N. Y., for $7.50.

Intended to assist electrical engineers to understand and apply new electronic equipment in industry, the reference book contains 36 chapters on the basic theory of electrons and the design, application and maintenance of electronic equipment. The well-illustrated chapters were written by the engineers and research scientists who have made many of the contributions to this expanding field.

Besides presenting underlying theories and design factors, the book brings the electrical engineer up to date on developments in electronic instruments, motor control, dielectric heating of woods and plastics, resistance welding, x-ray and photoelectric devices and other fields of electronics.

Book Covers World War II Metals Price Control

The History of Basic Metals Price Control in World War II, by Robert F. Campbell; cloth, 263 pages, 6¼ x 9 inches; published by Columbia University Press, New York, for $3.25.

Conceived and executed while the author was employed by the History Branch of the Office of Price Administration, the book attempts to evaluate critically and objectively the measures undertaken by that agency during the war period to regulate the prices of the basic metals: Iron, steel, aluminum, copper, lead, zinc and the scrap metals. In the introduction, inflation and the problem of stabilization and development of price control and its organization

and authority are covered, this being the stepping stone to the succeeding chapters.

Commencing with the first rise in the price of the above metals in 1940 and the resultant formation of the control authority, the book goes on to detail bevavior of metals prices, measures taken to increase supply and the imposition of price controls. Techniques of metals price control, standards of price action, including the legal background for action, and the administration of the premium price plan are covered in the following chapters.

The final chapters deal with adjusting basic metals prices and prices, production, costs and profits under price control. In his conclusion the author points out that such control as were set up should be closely integrated with allocation of materials, management of production, stabilization of wages and allocation of manpower. Four appendices containing tabular information, a bibliography and an index complete the book.

Trade Index Lists 10,000 Canadian Manufacturers

Canadial Trade Index—1948; published by Canadian Manufacturers Association Inc., Toronto 1, Canada; cloth, 1122 pages; 6¾ x 10¼-inches; $6.00.

An alphabetical list of approximately 10,000 manufacturing firms with addresses, branches, brands and trade names, cable addresses and foreign representatives and a classified list of thousands of industrial products with the names of firms manufacturing them are listed in this publication. It also includes a special export section giving basic information in regard to government services, foreign trade controls, methods, financing, price quotations, etc.

All copies of the book include a French index of products and there are limited editions which include a French and Spanish index of products and a French and Portuguese index of products. Included is a directory of exporters of agricultural produce and allied lines. The publishers state that over 600 new firms and many new products have been added in the last year, in addition to the thousands of revisions and alterations.

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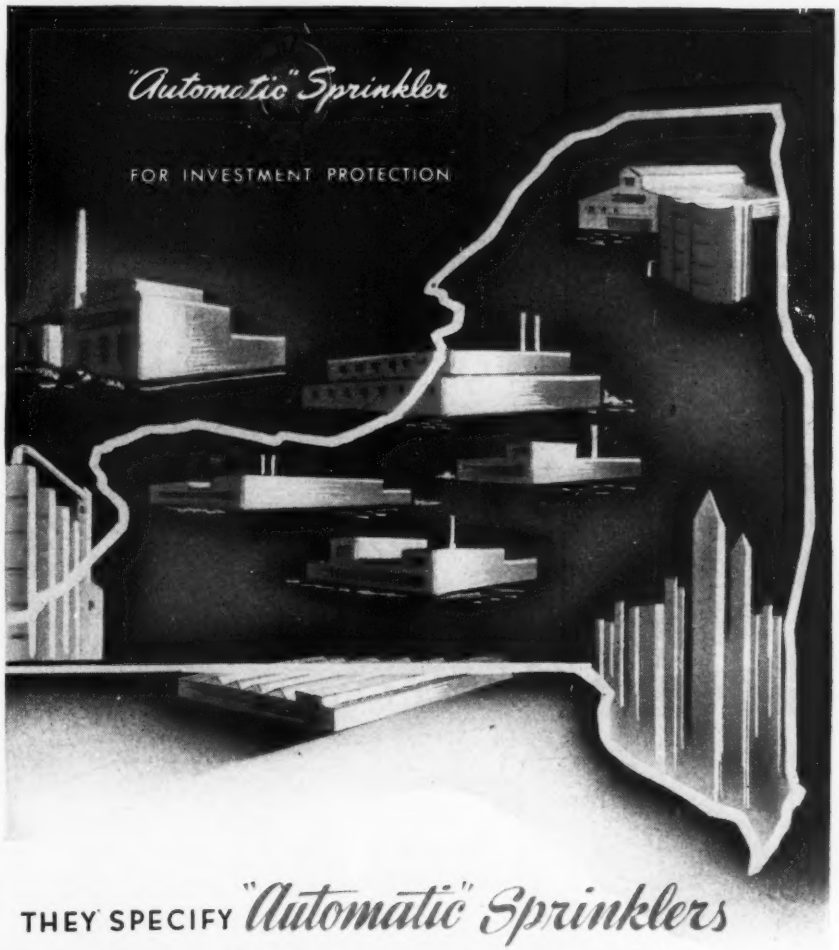
Section 5 the Steel Products Manual covering sheet steel piling was published recently by American Iron & Steel Institute, New York. Contained in the booklet are definitions, regular manufacturing practices, special manufacturing practices and manufactures' standard specifications.



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FIRE can do only the damage you permit it to do. If it destroys your possessions, it is because those possessions are permitted to be food for flames, and there is really nothing at all mysterious about the process of combustion.

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The accomplishments of "Automatic" Sprinkler, during more than sixty years of fire protection pioneering, spell constant advancement and development. The results are best measured in terms of product dependability and service . . . substantial reason why "Automatic" Sprinklers figure more and more prominently as specified equipment for both old and new construction. *They're an important investment today . . . perhaps welcomed protection tomorrow.*

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OFFICES IN PRINCIPAL CITIES OF NORTH and SOUTH AMERICA

Two-Day Course for Spring Designers

Offered by Hunter Spring Co.

DESIGN engineers who have occasion to specify springs are invited to attend a new 2-day refresher course on spring design and specification to be held during alternate weeks at the plant of Hunter Spring Co., (formerly Hunter Pressed Steel Co.) Lansdale, Pa., starting Aug. 31, according to an announcement made by Knowlton D. Montgomery, president.

The course is being offered in the conviction that spring specification today is largely done without sufficient attention to the service which can be expected of a spring and the dollar economies possible by more careful attention to design details. It is further felt that designers are largely unaware of the tolerances and precision which can and cannot be attained.

Included in the course will be demonstrations of tolerance computation, open forums and discussions, plant visitations, and six lectures on: Basic spring design, checking of spring specifications, controlling the test load, spring materials and stresses, do's and don'ts in tolerance specification, and inspection and testing methods.

Engineering executives who feel that their designers should attend, or who are asked by designers to make arrangements, should apply to Hunter Spring Co. by letter so dates can be set with an eye both to mutual convenience and the organization of compatible groups. Tuesdays and Wednesdays have been selected, and the course will be repeated on alternate weeks. Only expenses involved will be living expenses and travel to and from Lansdale, Pa.

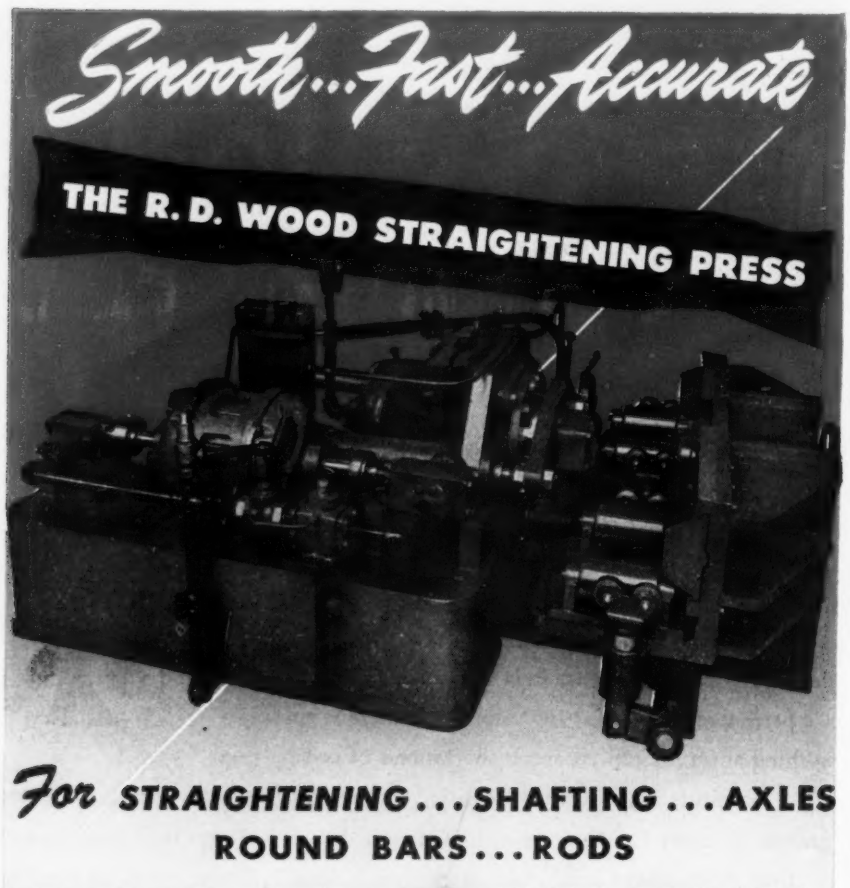
First Venture Successful

The sponsor company is launching the course in answer to a demand stemming from the success of its similar 2-day course given since Apr. 20 for inspectors. Already the inspector's course has been attended by executives, inspection engineers, designers and quality control specialists representing the following firms: General Electric, Thompson Products Co., Landers, Ferry & Clark, Minneapolis-Honeywell, Brown Instrument, The Vendo Co., Ward Leonard Electric Co., Radio Corp. of America, Stackpole Carbon Co., Heinemann Electric Co., Schramm Inc., IBM Corp., Fairchild Aircraft, ITE Circuit Breaker Co., Westinghouse, Monroe Calculating Machine Co., Army Chemical Corps Procurement, American Optical Co., and Textile Machine Co.

Instruction staff of the latest course includes: P. C. Clarke, assistant general manager, O. G. Meyers, chief engineer, Spring Division, C. H. Sacks, cost controller, F. C. Schulze, chief inspector, F. A. Votta Jr., engineer, Apparatus Division, R. P. Coleman Jr., technical editor, and G. A. Williams, designer.

At the close of the course a loose-leaf manual will be presented to each participant as permanent reference regarding the details of the various subjects covered.

Special quarters in the new Hunter plant in Lansdale have just been provided both for the refresher course on spring design and specification and the already-operating training



The modern design and quality construction of this 200-ton R. D. Wood Shaft Straightening Press are your guarantee of smooth, fast, accurate handling of work . . . *plus* increased production. The press frame is constructed of heavy welded steel and carries individual cast steel main and pull-back cylinders. Press table is 73" long with a gap of 13" between dies. Resistance blocks are movable on the vertical frame face. The table is provided with four heavy stationary rollers for shifting shafts lengthwise, as well as four sets of lifting and turning rollers operated by an air cylinder. An adjustable stop, which will take full press load, is located in the center of the press frame to prevent over-bending. High and low pressure pumps, operated by a 20-hp motor, provide a ram speed of 72" per minute for low pressure closing. High pressure ram speed is 8.5" per minute. Send today for descriptive literature. R. D. Wood Company, Ledger Building, Independence Square, Philadelphia 5, Pa.

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R. D. Wood Company

EST. 1803

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M.E.*

can point the way to EASIER HANDLING!

Give your M.E. his head! Let him show you that handling big castings need not be a backbreaking struggle. A casting that weighs 200 lbs. in iron weighs just 50 lbs. in magnesium—can be *handed* through production without need for trucking or hoisting.

Look for bigger sales with a magnesium-light product, whether it's a vacuum cleaner or a production machine. Easier finishing, too. Your first cut can be your finish cut—to a superlative finish. And look for deliveries on dependable schedules in the quantities you need for full production, with American Magnesium products.

Encourage your M.E.! Or, if you haven't one in your shop, we'll be glad to send one of ours. ALUMINUM COMPANY OF AMERICA, sales agent for American Magnesium products, 1721 Gulf Building, Pittsburgh 19, Pennsylvania.

*M.E., in this case, means Magnesium Enthusiast, and Mechanical Engineer as well. He's probably young, may have joined you since the war. He knows from experience the powerful appeal of American Magnesium parts: castings 75% lighter than iron, 35% lighter than aluminum. He knows the economics of magnesium which makes his recommendations practical.

MAGNESIUM MAZLO PRODUCTS

AMERICAN MAGNESIUM CORPORATION

SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

course for inspectors. Hunter considers both courses as its contribution to the "upgrading of skill and understanding in the application of precision springs to precision products."

Standardization Program Aids Valve Industry

Description of the manner in which the national standardization program carried on by Manufacturers Standardization Society of the Valve and Fitting Industry has helped reduce the cost of production and cut down investment in special patterns, tools, jigs and fixtures is contained in the current issue of Industrial Standardization, published by American Standards Association, New York. The article explains how volumes of paper work and blueprints, necessary in the past, have been eliminated through the use of standards.

An example of the value of this procedure is that standardization of pipe flanges and fittings widely used in the industry permits interchangeability on the same type of products made by different manufacturers. It is possible to order proper location and size of tapping on pipe and fittings in simple terminology with no chance of confusion.

New Edition of Metals Handbook Published

More than 600 engineering and production specialists contributed to compiling of the Metals Handbook, 1948 edition, which was published recently by American Society for Metals, Cleveland. This volume is larger than any previous edition prepared by member scientists of the society.

It is divided into four principle sections: General, ferrous metals, nonferrous metals and constitution of alloys. In the general section are included new summaries of wear, oxidation, stress corrosion, relief of residual stress and service failures. Ferrous metals are covered from manufacture of iron and steel, through shaping, testing, structural properties, welding, heat treating and finishing to hardening coating and surface treatment. Included for the first time in the nonferrous section are discussions of melting, shaping, treating and corrosion.

Specifications Issued For Aluminum Fuel Tanks

Acceptance of sheet aluminum for use in manufacture of fuel oil storage tanks was covered in a set of standards recently issued by Underwriters' Laboratories Inc., New York. It is based on results obtained by engineers of Reynolds Metals Co., Louisville, and other aluminum producers working with manufacturers of 275-gallon fuel oil storage tanks.

Minimum thickness of the sheet from which head and shell are to be manufactured has been set at No. 12 Brown & Sharpe gage which is 0.102-inch. Tensile strength of 18,000 pounds per square inch is indicated as minimum for the sheets to be used in making tanks. Sheets used must be positively identified as to alloy and temper by manufacturer.

—o—

Report tabulating raw materials used both during the war and at present in manufacture of sintered magnets in Germany was recently released by Office of Technical Services, Department of Commerce, Washington. It describes mixing and milling, pressing, sintering, molybdenum wound furnaces and carbon tube furnaces, temperature and densities, use of titanium, magnetic values, heat treating, grinding and magnetizing, shapes of magnets and future plans of the firm.

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BUCKEYE
"FOR THAT EXTRA SERVICE"
SILICA FIRESTONE

New Products and Equipment

Welder Controller

Complete electrical control for a small foot or motor operated resistance welding machine is provided in Type BBG-1 combination controller developed by Square D Co., 4041 N. Richards St., Milwaukee 12, Wis. The single enclosure contains a pneumatic welder timer, a 100 ampere high speed magnetic welder contactor and

a control transformer. For operator safety initiating switch and control circuits operate at 110 volts isolated from power supply. Timer is mounted on a Safront swingout panel with adjusting dial on front and all energized parts in rear.

Controllers are designed to permit either common or separate control supply connections. A dual primary control transformer may be connected for 110, 220 or 440 volts 60 cycles or for 380 volts 50 cycles.

Check No. 1 on Reply Card for more Details

High Capacity Cooler

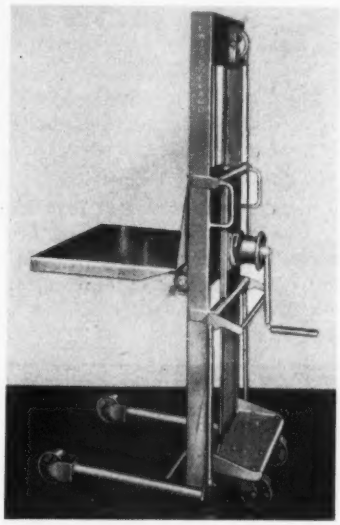
Some 1185 gallons of 40° water per hour—assuming a 60° inlet temperature—can be delivered by a high capacity industrial water cooler currently manufactured by Temprite Products Corp., 4 Piquette avenue, Detroit 2, Mich. Capable also of cooling alcohol, light oils and certain chemical solutions, it is said to make an efficient, compact unit where liquids are used intermittently in very large quantities.

Design of the unit—referred to as the Temprite cooler—is based on the so-called "flooded" cooling principle. Water coils are submerged in the liquid refrigerant itself, and heat of the water being used passes directly into the main body of the refrigerant. The cooler, measuring 14 inches in diameter by 54 inches high, is completely equipped with liquid refrigerant and control valves. It operates at a temperature only 4° lower than the desired exit water temperature, allowing use of a high-suction pressure condensing unit.

Check No. 2 on Reply Card for more Details

Lightweight Hoister

Lifting loads to working height for convenient reach of the workman and transferring or carrying materials to and from bench, press or other machine are principal uses of a rugged, lightweight stacker recently introduced by Lewis-Shepard Products Inc., 279 Walnut St., Watertown 72,



Mass. Planetary gear drive winch permits placing and holding platform at any level. Winch handle cannot spin or get away from operator when lowering load and is designed to swing out of way when not in use. One revolution of handle gives full 3 inches lift.

Hoister is stocked in a standard size of 500 pounds capacity. Platform is 24 x 24 inches with a 5 ½-inch lowered height and a 58 inch lifting height. Overall height is 71 inches and unit is equipped with either steel, rubber tired or molded plastic wheels, 5 inches in diameter.

Check No. 3 on Reply Card for more Details

Dial Feed Press

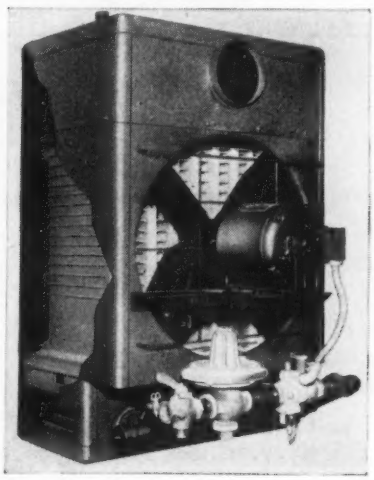
Built to perform secondary operations such as redrawing, piercing, stamping, broaching, wiring, etc., the dial feed presses, designed by Federal Press Co., Elkhart, Ind., may be set to perform several operations in sequence. They may be used for assembling, riveting and closing operations on finished parts and on material other than metal. For operations in sequence, it is necessary to balance the operations so that the strain on the slides will not be far off center.

Operator places shells in the bushings or on posts at the front of the dial. From this point they are carried around into alignment with the punch or punches and then carried further on and either mechanically ejected, picked off or dropped through the base. An unskilled operator can catch every stroke of a press operating continuously at about 60 strokes per minute. In operating at the reduced speed, a geared press is advised.

Check No. 4 on Reply Card for more Details

Gas-Fired Heaters

To withstand corrosive effects of the products from combustion gasses, the new series C gas-fired unit heaters now made by Automatic Gas Equipment Co., 301 Bruston avenue, Pittsburgh 21, Pa., incorporate cast iron construction in both the heat exchanger and the combustion cham-



ber. Both are cast in one piece and the extended heating surface fins of the heating exchanger are cast integral.

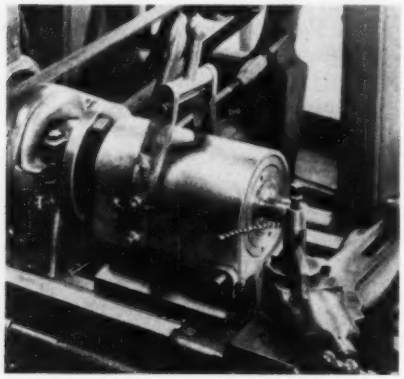
Incorporation of a built-in draft hood that absorbs all excessive chimney action enable the units to consume exactly the right amount of air to support perfect combustion without permitting an excess of air to lower heating efficiency. The company reports the heaters can be installed wherever warm air is required over a given area for heating, ventilating or for drying. Both motor and fan in each unit are powerful enough to deliver the air exactly where needed, direction of flow being

controlled by adjustable, horizontal louvers.

Check No. 5 on Reply Card for more Details

Collet Chuck

Increased holding capacity, maintenance of absolute accuracy and elimination of overhang and chatter are features of a new collet speed chuck recently developed by Zagar Tool Inc., 23880 Lakeland Blvd.,



Cleveland 17, O. Chuck which rotates on precision ball bearings derives its turning power from spindle of machine to which it is attached. By elimination of overhang heavier work can be done.

Collet of the Model B chuck remains stationary while opening and closing, making it possible to maintain accurate length dimensions on parts being machined. Working mechanism of the collet closing device is located between two precision ball bearings, increasing accuracy. Chucks are designed in 1 and 2 inch through capacities and are being made to order to suit any type of lathe, grinding machine or other rotating spindle.

Check No. 6 on Reply Card for more Details

Hardness Reader

Direct brinell hardness number reader, designed to fit conveniently into the grip of a person's hand, was developed recently by Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4, Mich. There are two standard dial calibrations being produced, one for 10 mm ball diameter with 3000 kilogram load and the other for 10 mm ball diameter with 500 kilogram load. Hardness readers with special dials for other ball diameters and loads are made to order.

Hardness impressions are made in the usual manner with a brinell tester. Hardness reader is then pressed against piece under test so that ball point of instrument enters impression and hand points to correct hardness number without use of a conversion table. Accuracy obtained is equivalent to that secured through use of

conventional measuring microscope and conversion table.

Check No. 7 on Reply Card for more Details

Boom Drill

Air powered booms which can be raised or lowered at the touch of a lever feature the air powered drill jumbo being manufactured by Ingersoll-Rand Co., Phillipsburg, N. J. Unit was designed for high speed driving of drifts, crosscuts and tunnels and is capable of working in an opening with a height up to 9 feet with a width varying between 5 and

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HI-GRADE METALLIC

FAMOUS

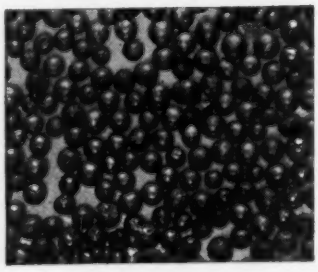
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

SHOT

- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

GRIT

- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



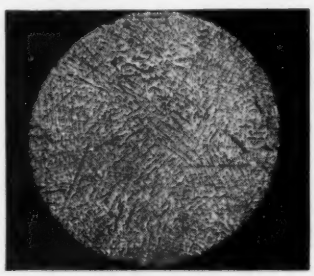
UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY

3896 LONYO ROAD

DETROIT 10, MICHIGAN

CEdar 7200



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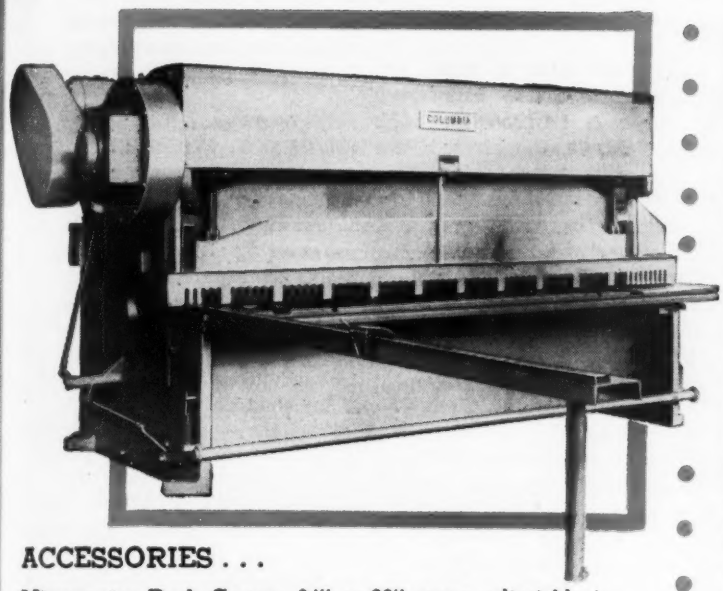
IMMEDIATE DELIVERY

Columbia STEEL SQUARING SHEARS



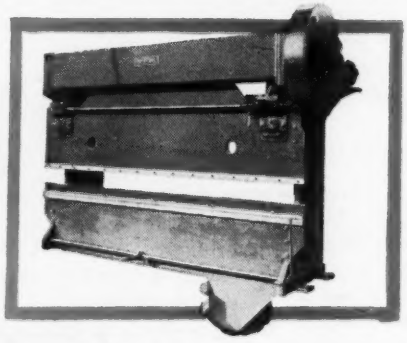
ACCESSORIES . . .

Micrometer Back Gauge, 24" or 36" range, adjustable in sixty-fourth inches. Provision for taper shearing. Front or back operation.

Squaring Arm of ten-foot-range, with steel scale and adjustable folding gauge finger, for use on either end of the shear.

Front Gauge with 50" range.

POWER PRESS BRAKES



Columbia Power Press Brakes, for forming mild steel, 4 to 10 feet, in 3/16" to 7/16" gauges, offer many cost-cutting advantages.

Write for Bulletins

COLUMBIA MACHINERY AND ENGINEERING CORPORATION

HAMILTON, OHIO

with all these ADVANCED DESIGN FEATURES

Greatly increased production which makes Columbia one of the nation's largest shear manufacturers makes possible IMMEDIATE DELIVERY of new post-war Columbia Steel Squaring Shears with all important design improvements you need for greatest shearing speed, accuracy and economy. It will pay you to investigate the experience of hundreds of Columbia users before buying. Note these Columbia features:

- **LONGER SHEAR BLADES** than are normally required for cutting full width of material eliminate tearing or nicking when notching or trimming sheets longer than blades.
- **ADJUSTABLE UPPER BLADE HOLDER** has a heavy brace with provision for readily adjusting horizontal alignment of blade.
- **RIGID STEEL CONSTRUCTION** of the base, housing, table, slide, top cross tie, etc., for maximum strength, durability and precision.
- **GEARS OPERATE IN OIL.** Steel gears, precision machine cut, operate in an oil-tight case.
- **SOLID, POSITIVE CLUTCH** has six alloy-steel jaws with hardened faces. Automatic stop cam.
- **HEAT-TREATED, FORGED ECCENTRIC SHAFT** — eccentrics forged integral with shaft.
- **MECHANICALLY-OPERATED AUTOMATIC HOLD-DOWN** has individual high-compression spring compensating fingers, insuring unfailing operation.
- **STAINLESS STEEL SCALES.** Non-rusting, easily-read.
- **CENTRALIZED LUBRICATION** for adequate, dependable lubrication to main bearings.
- **FINGER GUARD** in front of the shear blades.
- **CAPACITY.** 10 and 12 foot models will shear 3/16" mild steel at 60 strokes per minute. Six-foot models will shear 1/4" mild steel at same speed. Standard throat depth, 18 inches.

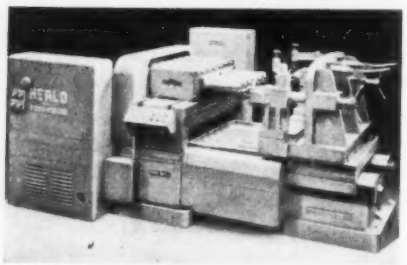
14 feet. Air and water are carried to the drills through the lightweight, high strength, seamless steel tubes used to construct the booms.

Controls are located on front end of booms where they are convenient to operator. Booms lock into position and cannot creep or settle during drilling operation. Drills used are equipped with long feeds for handling of long drill steel, resulting in high drilling speed.

Check No. 8 on Reply Card for more Details

Multiple Purpose Units

Boring, facing, turning, chamfering and grooving operations on large, heavy work may be performed by the model 521 and 522 Bore-Matic machines, largest in the new line built by Heald Machine Co., Worcester 6, Mass. Heavy, awkward work can be handled with convenience since the table is built low to the floor, permitting easy loading from



conveyor or overhead crane. As many as seven or more individual boringheads or a special multispindle head unit to suit the job can be installed on each bridge.

Model 521 (illustrated) is a single end and model 522 is a double end machine. Both incorporate a massive, one-piece base casting with widely spaced V and flat ways, permanently lubricated boringheads, adequate power for roughing, outboard tank and drive to eliminate effects of heat and motor vibration, uniform hydraulic feeds and provision for different rates of "in" and "out" feeds when two-way boring is required. All rotating tools are of the same hand on the double end machine.

Check No. 9 on Reply Card for more Details

Continuous Filter

Small, continuous vacuum filter which is a special adaptation of their string filter has been developed by Filtration Engineers Inc., 858 Summer Ave., Newark 4, N. J., for separation of iron oxides and other solids out of spent pickle liquors used in steel mills. The device separates suspensions into easily handled solid cake and clear filtrate which can be released into streams without danger of pollution.

Filtering rate of this model ranges from 60 to 600 pounds of dry solids per hour, depending on nature of waste liquor and type of neutralizer used. It also works well on pickle liquor that has been diluted before neutralization and on waste acids that have been used to neutralize waste alkalies before being completely neutralized by lime or other process.

Check No. 10 on Reply Card for more Details

Die Chasers

Carbide tipped die chasers with ground thread forms are now being produced by Jones & Lamson Machine Co., Springfield, Vt., for selected applications on turret lathes, automatics and threading machines. As an example of their use, a ¾-inch stud can be machined to a high quality finish with spindle turning at 2000 revolutions per minute, thus eliminating the need for shifting to a low threading speed.

Besides increasing speeds, lengthy tool life of these chasers makes them very economical when they are suitably applied and correctly handled. They are outstandingly effective in steel and still more efficient in hard rubber, fiber and abrasive materials which have a rapid dulling action on ordinary chasers.

Check No. 11 on Reply Card for more Details

• • •

TACHOMETER HEAD: Available for use with standard SAE marine, diesel and AN aircraft tachometer take-offs are small, light weight tachometers heads, manufactured by Metron Instrument Co., Denver 9, Col. The type 54 head can be used with any Metron tachometer indicators to give full scale readings between 200 and 10,000 rpm.

Check No. 12 on Reply Card for more Details

DUCT LINING: Ceilcote Co., Cleveland, O., is offering an acid and alkali-proof lining material for fume carrying ducts. Known as Spray Grade, it has a maximum temperature resistance of 300° F and will bond to wood or metal. Application is by special spray equipment which builds up a lining up to ⅛-inch thickness.

Check No. 13 on Reply Card for more Details

COIL CLEANER: Lime scale in hot water coil-equipped apparatus or hot water tanks of automatic heaters is dissolved by Corodex Coil Clean, made by Allied Products Co., Chicago 13, Ill. Easy to use, the liquid goes to work immediately with a foaming action. When foaming stops, unit is clean. It will not harm metal or hands of user.

Check No. 14 on Reply Card for more Details

EMULSION CLEANER: Equally efficient for cleaning ferrous or nonferrous metals, an emulsion cleaner, Houghto-Clean 220, made by E. F. Houghton & Co., Philadlephia, Pa., forms a stable nonfoaming emulsion with hot or cold water. It readily mixes with water, is nontoxic and contains a corrosion inhibitor.

Check No. 15 on Reply Card for more Details

FREQUENCY COUNTER: System of high speed electronic counters, developed by Potter Instrument Co. Inc., Flushing, N. Y., provides means of measuring frequencies with accuracies of 1 part in ten million or greater. Any frequency from 0 to 1.6 megacycle can be measured. Basic units are two high speed electronic counters, a crystal oscillator and an electronic switch.

Check No. 16 on Reply Card for more Details

LOCKING GRIP PLIERS: Greater throat capacity and higher applied pressure are features of two Knu-Vise plier models, designed by Lapeer Mfg. Co., Lapeer, Mich. With no change in total length, the square throat opening of the new design permits thicker work to be inserted between the jaws to a greater depth. Model P-1200 has a throat capacity of $1\frac{9}{32}$ x 2¼-inch and 1200 pounds clamping pressure; Model P-1800 has a $1\frac{9}{32}$ x 2¼-inch throat and 1800 pound pressure jaws.

Check No. 17 on Reply Card for more Details

COLLET CHUCK: Model 1200 collet chuck, made by Erickson Tools Division, Cleveland 14, O., is for rigidly holding large size work pieces. It accommodates Erickson standard collets over a range of 8 to 10 inches in increments of 1/32-inch. Piece is firmly gripped throughout the length of the collet.

Check No. 18 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL SUPPLY— Impact of voluntary allocations is being felt with increasing force in the steel markets. Currently, rank-and-file steel consumers anticipate a cut in fourth-quarter allotments as the mills delay setting up firm commitments for the period because of uncertainty as to the scope of preference requirements.

A few sellers have established October allotments, and in scattered instances 3-month quotas have been set up. In all cases consumers have been advised allotments are tentative and may be revised before the quarter begins. In the main, the mills are delaying action with the result consumers are on tenter-hooks, particularly those with little prospect of getting into priority work. An important development is that consumers are assured of being able to replace any steel they use in defense work as result of action last week by the Steel Products Industry Advisory Committee knocking out the provision in the military allocation program which compelled use of all steel on hand by a contractor before he became eligible for allocations.

ALLOCATIONS— Expanding allocations are certain to offset any production gains experienced over coming months. However, no one knows with any certainty how much steel will be taken out of the domestic supply pool. Acually, there is a lot of loose thinking on the subject. Estimates range from 5 million up to 16 million tons for the year. The latter figure appears fantastic.

Currently, around 300,000 tons monthly are under approved allocation and by fourth quarter this may be upped half again as much. Consequently, it would appear 5 million tons annually would be an outside figure, or roughly about 8 per cent of the expected finished steel output. This isn't too alarming. The joker, however, is in the fact the percentage take in specific products, such as scarce sheets, may be higher. Furthermore, it is likely new allocation programs will be approved. Last week, for example, allocation of 59,000 tons of sheets and strip for prefabricated housing was approved over the vigorous protests of industry in general. Also 40,000 tons monthly for tankers and 2000 tons monthly for aeronautical research construction were approved.

PRODUCTION— Prospects are favorable for continued high steel production throughout the remainder of the year. Seasonal influences generally are more favorable in the fall and early winter, and the outlook for stable labor conditions is promising. In view of this it would not be surprising if output increased. Ingot production in the first seven months aggregated 50,145,401 tons.

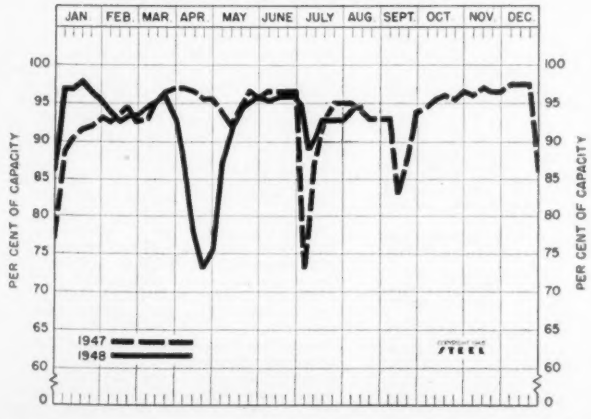
RAW MATERIALS— Tight pig iron supply appears to be growing in severity. Consumers everywhere are critically short but the situation in New England is especially bad. Last week, at a meeting of New England governors the only solution suggested to relieve the iron shortage was an intensified scrap drive. Scrap, however, is anything but plentiful with most consumers holding only modest inventories at best. Considerable hope for relief is pinned on the possibility substantial tonnage may be forthcoming from Europe.

PRICES— While supply continues their principal concern, steel consumers are appalled by the recent increase in steel costs, an increase that has been made particularly sharp in many cases by the shift of producers to the f.o.b. mill pricing system.

Last week upward price adjustments continued to be made. Belated advances on pig iron were announced by several interests, including silvery iron.

COMPOSITES— STEEL's arithmetical price composite on finished steel (revised) held unchanged last week at $93.55. A year ago it stood at $75.41. Other price composites also were unchanged from the preceding week with semifinished steel, $74.85, steelmaking pig iron, $43.86, and steelmaking scrap, $43.33.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Aug. 14	Change	Same Week 1947	Same Week 1946
Pittsburgh	93.5	None	98	98.5
Chicago	91	+0.5	93.5	92.5
Eastern Pa.	91	+1	93	81
Youngstown	103	None	92	88
Wheeling	95.5	+3	81.5	93.5
Cleveland	88.5	None	96.5	91.5
Buffalo	101.5	+2.5	88.5	88.5
Birmingham	100	None	99	99
New England	85	None	90	90
Cincinnati	99	−4	87	89
St. Louis	78	−2	84.5	54.5
Detroit	100	None	88	90
Estimated national rate	94.5	+0.5	94	90

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Aug. 14	Aug. 7	Month Ago July 1948	Year Ago Aug. 1947	5 Years Ago Aug. 1943
Finished Steel	$93.55	$93.55	$85.58	$75.41	$56.73
Semifinished Steel	74.85	74.85	71.11	56.80	36.00
Steelmaking Pig Iron	43.86	43.86	41.42	36.06	23.00
Steelmaking Scrap	43.33	43.33	41.43	39.00	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

July 1948	3.79216c
June 1948	3.58150c
July 1947	3.20098c
July 1943	2.45880c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June and July, 1948 figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	Aug. 14 1948	July 1948	May 1948	Aug. 1947
Steel bars, Pittsburgh mills	3.45c	3.105c	2.875c	2.90c
Steel bars, del. Philadelphia	3.79	3.545	3.365	3.28
Steel bars, Chicago mills	3.35	3.065	2.875	2.90
Shapes, Pittsburgh mills	3.25	2.975	2.775	2.80
Shapes, Chicago mills	3.25	2.965	2.775	2.80
Shapes, del. Philadelphia	3.48	3.18	2.98	2.94
Plates, Pittsburgh mills	3.50	3.155	2.925	2.95
Plates, Chicago mills	3.40	3.115	2.925	2.95
Plates, del. Philadelphia	3.71	3.41	3.21	3.15
Sheets, hot-rolled, Pittsburgh mills	3.275	2.975	2.775	2.80
Sheets, cold-rolled, Pittsburgh	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.10	3.90	3.90
Sheets, hot-rolled, Gary mills	3.25	2.965	2.775	2.80
Sheets, cold-rolled, Gary mills	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.10	3.90	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.140	3.05	2.80
Strip, cold-rolled, Pittsburgh mills	4.00	3.875	3.775	3.55
Bright basic, wire, Pittsburgh	4.15	3.965	3.725	3.675
Wire nails, Pittsburgh mills	5.15	5.25	5.125	4.25
Tin plate, per base box, Pittsburgh	$6.70	$6.68	$6.60	$5.75

Semifinished

Sheet bars, Chicago mills	$67.00	$62.80	$60.00	$53.57
Slabs, Pittsburgh, Chicago	52.00	47.80	45.00	40.18
Rerolling billets, Pittsburgh	52.00	47.80	45.00	40.18
Wire rod 7/32 to ¼-inch, Pitts.	3.45c	3.419c	3.175c	2.925c

Pig Iron

	Aug. 14 1948	July 1948	May 1948	Aug. 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$44.08	$44.08	$41.038	$37.83
Basic, Valley	43.00	40.60	39.00	36.00
Basic, eastern del. Philadelphia	46.17	43.77	42.17	38.72
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	43.58	40.538	37.33
No. 2 fdry., del. Philadelphia	46.67	44.27	42.67	39.22
No. 2 foundry, Chicago	43.25	41.10	39.00	36.00
No. 2 foundry, Valley	43.50	41.10	39.50	36.50
Southern No. 2 Birmingham	43.38	40.72	38.63	34.51
Southern No. 2 del. Cincinnati	49.09	46.43	43.90	39.38
Malleable, Valley	43.50	40.30	39.50	36.50
Malleable, Chicago	43.50	41.50	39.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	62.00	59.60	56.50	44.00
Ferromanganese, fob cars, Pittsburgh	148.00*	151.15	151.15	140.25

*Fob Aetna, Pa.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.75	$40.25	$39.50
Heavy melt. steel, No. 2, E. Pa.	41.50	40.00	39.00	38.35
Heavy melt. steel, No. 1 Chicago	41.75	40.05	39.25	39.625
Heavy melt. steel, No. 1 Valley	42.75	40.75	40.25	40.50
Heavy melt. steel, No. 1, Cleveland	42.25	40.25	39.75	38.81
Heavy melt. steel, No. 1 Buffalo	45.50	44.30	43.00	40.88
Rails for rerolling, Chicago	62.50	57.80	51.75	47.125
No. 1 cast, Chicago	70.00	68.50	66.00	43.50

Coke

Connellsville, beehive furnace	$14.25	$14.25	$12.94	$12.00
Connellsville, beehive foundry	17.00	17.00	15.06	14.50
Chicago, oven foundry, ovens	19.86	20.75	18.50	18.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa., mill; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester mill; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., mill; 4.15c, Monessen, Pa., mill. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Monessen, Pittsburgh, Aliquippa, Pa., mills; 3.35-3.55c, Pittsburgh mills; 4.05c, Pittsburg and Torrance, Calif., mills; 4.10c, Atlanta, Ga., mill.

Rail Steel Bars: (Base 10 tons): 3.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich., mill.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh mill; 4.25c, Monessen, Pa., mill; 4.30c, Ecorse, Mich., mill; 4.36c, Plymouth, Mich., mill; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Mass., Beaver Falls, Pa., and Massillon, O., mills; 4.45c, Camden, N. J., mills.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa., mill; 4.95c, Worcester, Mass., mill.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich., mill.

Reinforcing Bars (New Billet): To fabricators: 3.35c, mill, except: 3.55c, Monessen, Pa., mill; 4.05c, Pittsburg and Torrance, Calif., mills; 4.10c, Atlanta, Ga., and Pittsburgh mills. To consumers: 4.10c, mill.

Reinforcing Bars (Rail Steel): 4.65c, mill.

Iron Bars: Single Refined: 8.60c, (hand puddled), Pittsburgh mill; 9.50c, Economy, Pa., mill. Double Refined: 11.25c (hand puddled), Pittsburgh mill; 11.00c, Economy, Pa., mill. Staybolt: 12.75c, (hand puddled), Pittsburgh mill; 11.30c, Economy, Pa., mill.

Hot-Rolled Ingot Iron Bars: 3.60c, mill.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Pittsburgh and Cleveland, mills; 3.45c, Ecorse, Mich., mill; 3.95c, Pittsburg and Torrance, Calif., mills; 5.00c, Conshohocken, Pa., mill.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.65c, Niles, O., mill; 5.05c, Torrance, Calif.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., and Ecorse, Mich., mills; 4.95c, Pittsburg, Calif., mill.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 5.00c, Niles, O., mill; 5.15c, Pittsburg and Torrance, Calif., mills.

Galvannealed Sheets: 4.95c, mill, except: 5.55c, Niles, O., mill.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 5.00c, mill, except: 5.40c, Granite City, Ill., mill; 5.75c, Pittsburg and Torrance, Calif., mills.

Copper-iron or pure iron: 5.35c mill, except: 5.75c, Granite City, Ill., mill.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, mill.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Long Ternes Ingot Iron: 5.20c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 4.70c, Ecorse, Mich., mill; 6.00c, Niles, O., mill.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.65c, Granite City, Ill., mill; 6.05c, Niles, O., mill. Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill., mill; 6.55c, Niles, O., mill. Cold-rolled, 6.20c, mill. Motor: 6.70, mill, except: 6.90c, Granite City, Ill., mill; 7.20c, Brackenridge, Pa., mill. Dynamo; 7.50c, mill, except: 7.40c, Follansbee, W. Va., Toronto, O., mill; 7.60c, Granite City, Ill., mill; 7.90c Brackenridge, Pa., mill. Transformer 72, 8.05c, mill, except: 7.90c, Follansbee, W. Va., Toronto, O., mills; 8.90c, Brackenridge, Pa., mill. 65, 8.65c, mill, except: 8.60c, Follansbee, W. Va., Toronto, O., mills; 9.60c, Breckenridge ,Pa., mill. 58, 9.30c, mill, except: 10.30c, Brackenridge, Pa., mill. 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c,mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Hot-Rolled Drum Body Sheets: 3.95c, mill.

Oven Lining Sheets: 5.10c, mills.

Well Casing Sheets: 4.75c, mill.

Ingot Iron Sheets (18 gage and heavier): Hot-rolled, 3.50c, mill Cold-rolled, 4.50c, mill, Galvanized, 4.65c, mill, except: 4.95c, Indiana Harbor, Ind., mill.

Strip

Hot-Rolled Strip: 3.25c, mill, except: 3.25-3.30c, Chicago, Cleveland mills; 3.25-3.35c, Sharon, Pa., mills; 3.45c, Ecorse, Mich., Atlanta, Ga., mills; 3.60c, Detroit, mill; 3.70c, West Leechburg, Pa., mill; 4.00c, Pittsburg and Torrance, Calif., mills.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except: 4.00-4.25c, Chicago mills; 4.20c, Ecorse, Mich., mill; 4.45-4.50c, Detroit mills; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., mills.

Hot-Rolled Alloy: 5.10c, mill.

Cold-Rolled Alloy Strip: 9.50c, mill, except 9.80c, Worcester, Mass., mill.

Cold-Finished Spring Steel: 0.26-0.40 carbon, 4.00c, mill; over 0.40 to 0.60 carbon, 5.50c, mill; over 0.60 to 0.80 carbon, 6.10c; over 0.80 to 1.05, 8.05c; over 1.05 to 1.35, 10.35c; add 0.30c for Worcester mill.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb. 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30.

Holloware Enameling Black Plate: 29-gage, 4.75-4.95c per lb.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90-$6.10. Granite City, $6.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c. Pittsburgh and Cleveland mills; 3.45c, Sparrows Point, Md.; 3.60c, Aliquippa, Pa., mill; 3.65c, Ecorse, Mich., mill; 3.75c, Coatesville, Pa., mill; 3.95c, Claymont, Del., and Conshohocken, Pa., mills; 5.85c, Harrisburg, Pa., mill.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa., mill; 5.30c, Conshohocken, Pa., Sparrows Point, Md., and Johnstown, Pa., mills; 5.65c, Ecorse, Mich., mill.

Shapes

Structural Shapes: 3.25c, mill, except 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, and Aliquippa, Pa., mills; 3.85c, Torrance, Calif., mill.

Beams, Wide Flange: 3.20c, mill, except: 3.30c, Bethlehem, Aliquippa, Pa. mills.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., and Lackawanna, N. Y., mills.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta, Ga., mill; 4.25c, Sparrows Point, Md., mill; 4.45c, Worcester, Mass., mill; 4.50c, Monessen, Pa., mill; 4.70c, Portsmouth, O., mill; 5.10c, Pittsburg, Calif., mill.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md., Monessen, Pa., mills; 5.85c, Worcester, Mass., Trenton, N. J., mills; 6.50c, Pittsburg, Calif., mill.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa., mills; 5.50c, Worcester, Mass., Trenton, N. J. New Haven, Conn., mills; 6.15c, Pittsburg, Calif., mill.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90, Sparrows Point, Md., mill; 4.95c, Monessen, Pa., mill; 5.10c, Worcester, Mass., mill; 5.20c, Atlanta, Ga., mill; 5.75c, Pittsburg, Calif., mill. Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., mill; 5.40c, Monessen, Pa., mill; 5.55c, Worcester, Mass., mill; 5.65c, Atlanta, Ga., mill; 6.20c, Pittsburg, Calif., mill.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 103-124, Cleveland mills; 105, Sparrows Point, Md., mill; 109 Worcester, Mass., mill; 110 Atlanta, Ga., mill; 117, Portsmouth, O., mill; 123, Pittsburg, Calif., mill; $5.20 per 100 pound keg, Aliquippa, Pa., mill. $6.75, Conshohocken, Pa., and Wheeling, W. Va., mills; $4.77 per 100 lb., Williamsport, Pa.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113 Monessen, Pa., mill; 121 Atlanta, Ga., mill; 132, Pittsburg, Calif., mill.

Barbed Wire: Column 123 mill, except: Column 125, Sparrows Point, Md., mill; 126 Atlanta, Ga., mill; 128 Monessen, Pa., mill; 143, Pittsburg, Calif., mill.

Fence Posts (with clamps): Column 114, Duluth; Column 115, Johnstown, Pa.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., mill; 110, Atlanta, G., mill; 130, Pittsburg, Calif., mill.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	41½	14	1¼	49	33
¼	39½	16½	1½	49½	33½
⅜	36	12	2	49–50	33–34
½	43	25½	2½, 3	49½–50½	33½–34½
¾	46	29½			
1	48½	32½	3½ & 4	44½	28

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	23	39	22½	27–38½	10½–22
2½	42½–43½	26–27	42	25½	32½–41½	16–25
3	42½–43½	26–27	42	25½	35–41½	18½–25
3½ & 4	44½–46½	28–30	44	27½	38½–43½	22–27
5-6	44½	28	44	27½	38½–43½	22–27
7					43½	26

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	40½	...	1¼	48	32
¼	38½	...	1½	48½	32½
⅜	35	...	2	48–49	32
½	42	24½	2½ & 3	48½–49½	32½
¾	45	28½	3½ & 4	43½	
1	47½	31½			

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	38½	22	38	..	26–37½	9½
2½	41½–42½	26	41	..	31½–40½	15
3	41½–42½	26	41	..	34–40½	17½
3½-6	43½–45½	29	44	..	37½–42½	21
8	45½	..	46	..	40½–44½	23
10	45	..	45½	..	41½–44	24
12	44	..	44½	..	40½–43	23

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+59½	+89	1¼	+22	+46½
½	+20½	+46	1½	+15½	+39
¾	+10½	+35	2	+ 7½	+30
1 and 1¼	+ 4½	+26	2½-3½	+ 5	+25.5
1½	— 1½	+22½	4	List	+19½
2	— 2	+22	4½-8	+ 2	+21
			9-12	+12	+30½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

		——Seamless——		—Elec. Weld—	
O.D. In.	B.W. Ga.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	37.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Rails, Supplies

Rails: Standard, over 60-lb: $3.20 per 100 lb, mill.

Light (billet): $3.55 per 100 lb, mill.

Light (rail steel): $4.70 per 100 lb., Williamsport, Pa.

Relaying, 60 lb and over: $60-$65 per net ton, f.o.b. warehouse.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb., mill. Untreated: $8.25, mill, except: $7.50, Fairfield, Ala., mill. $8.50, treated, Bethlehem, Pa., mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif., mill.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.25c, mill, except: 5.35c, Fairfield, Ala., Indiana Harbor, Ind., Lebanon, Pa., mills.

Axles: 5.20c, mill.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts. Add 19c per cwt in carlots, Lebanon, Pa., plant.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 70-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	41 off	.....
1-in. and smaller	.....	38 off
1⅛-in.-1-in.	39 off	.....
1⅛-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	.....	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants.

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off
Fob Lebanon, Pa.	
Structural ½-in. and larger	6.75c*
⅞-in. and under	48 off*

* Plus 19c per cwt in cl; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs. ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Stainless Steels

Mill prices, cents per lb, Watervleit, Dunkirk, Brackenridge, W. Leechburg, Baltimore and Buffalo, N. Y.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	28.75	32.50	40.75	24.25	32.00
302	28.75	32.50	40.75	25.75	33.75
303	31.50	34.75	43.00	32.50	39.75
304	31.25	34.75	43.00	28.00	35.75
308	34.75	40.75	49.00	34.00	43.00
309	43.00	48.00*	56.25*	44.50	56.25
310	59.00	62.25†	63.25	52.25	67.25
316	48.00	53.00	57.25	47.85	57.25
321	34.75	40.75	49.00	35.25	45.75
347	39.75	45.75	54.00	39.50	50.25
431	23.25	26.50	34.75	21.00	27.00
440A	28.75	34.25	40.25	28.50	43.50
STRAIGHT CHROMIUM STEEL					
410	22.50	25.75	32.00	20.25	26.50
416	23.00	26.50	32.50	22.00	28.00
420	28.50	34.00	40.25	28.50	43.50
430	23.00	26.50	34.75	21.00	27.00
430F	23.75	27.00	35.25	22.50	29.75
442, 443	27.00	30.75	39.00	28.50	38.50
446	33.00	36.25	43.50	41.75	62.25
$501	10.00	14.25	19.25	14.25	20.25
$502	11.00	16.00	20.25	16.00	21.50

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$44.00	$44.50	$45.00	$45.50
Newark, N. J., del.	46.39	46.89	47.39	47.89
Brooklyn, N. Y., del.	....	48.40	48.90	....
Philadelphia, del.	46.17	46.67	47.17	47.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	44.00	44.00	44.50	45.00
Boston, del.	52.42	52.42	52.92	....
Rochester, del.	46.22	46.22	46.72	47.22
Syracuse, del.	47.025	47.025	47.525	48.025
Chicago, furnace	42.50-43.00	43.00-43.50	43.50	44.00
Milwaukee, del.	44.22-44.72	44.72-45.22	45.22	45.72
Muskegon, Mich., del.	....	49.65-50.15	50.15	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del.	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	44.00	44.50
Erie, Pa., furnace	42.50	43.00	43.50	44.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	43.00	43.50	....	....
Seattle, Tacoma, Wash., del.	....	50.63	....	....
Portland, Oreg., del.	....	50.63	....	....
Los Angeles, San Francisco.	50.13	50.63	....	....
Granite City, Ill., furnace	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡Neville Island, Pa., furnace.	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	43.00	43.50	43.50	44.00
Sharpsville, Pa., furnace	43.00	43.50	43.50	44.00
Steelton, Pa., furnace	44.00	44.50	45.00	45.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	42.50	43.00	43.50	44.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	43.00	43.50	43.50	44.00
Mansfield, O.	46.87	47.37	47.37	47.87

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.: $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$56.50		
6.51-7.00	57.75	9.01- 9.50	64.00
7.01-7.50	59.00	9.51-10.00	65.25
7.51-8.00	60.25	10.01-10.50	66.50
8.01-8.50	61.50	10.51-11.00	67.75
8.51-9.00	62.75	11.01-11.50	69.00

Fob Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.75 furnace, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $50. Philadelphia $52.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $48.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads effective CaF_2 content, 70% or more $35, less than 60% $32.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-$15.00
Connellsville, foundry	16.00- 18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

† Nominal.

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, ovens	20.40
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
New England, del.	22.75
Birmingham, del.	17.86
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens.	19.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty; St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $50.
Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.80
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69%	18.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$2[illegible]

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.60
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.78

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	*H-R	*C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes	Carbon ⅜"–¾"	Floor ¾" & Thicker
Boston (city)	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24	5.54	5.89	7.34
Boston (c'try)	5.69	6.49	7.69	5.89	...	5.54	6.24	8.09	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.83	6.58	8.22	5.52-5-78	5.98	7.48
New York (c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.63	6.38	...	5.32-5.58	5.78	7.28
Phila. (city)	5.50-5.86	6.61-6.81	7.42-7.62	5.60	...	5.57-5.65	6.31	7.94	5.24-5.35	5.52-5.65	7.16
Phila. (c'try)	5.35-5.71	6.46-6.66	7.27-7.47	5.45	...	5.42-5.50	6.16	7.79	5.09-5.20	5.37-5.50	7.01
Balt. (city)	5.43†	6.33	7.53	5.49	...	5.54	...	...	5.48	5.68	7.13
Balt. (c'try)	5.28†	6.18	7.38	5.34	...	5.39	...	...	5.33	5.33	6.98
Buffalo (city)	5.25	6.00§	7.75	5.70	...	5.35	6.05	...	5.25	5.61	...
Buffalo (c'try)	5.10	5.85§	7.60	5.55	...	5.20	5.90	...	5.10	5.46	...
Pitts.	4.85-5.00§	5.75-5.85§	6.90-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Cleveland (city)	5.13-5.75[23]	5.75-6.04†	7.33-7.85[23]	5.02-5.69	...	5.19-5.34†	5.95-6.05†	7.94	5.19-5.57	5.39-5.54†	6.84-6.99†
Cleveland (c'try)	4.98	5.85	7.18	5.54	...	5.19†	5.90†	7.79	5.42	5.39†	6.84†
Cincinnati	5.26	6.11	...	5.52	6.07	5.52	60.7	...	5.37	5.61	6.91
Chicago (city)	5.20	5.90‡§	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (c'try)	5.05	5.75‡§	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city)	5.37	6.07‡§	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis	5.19§	6.09§	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41
Birm'ham (c'try)	...	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26
Omaha, Nebr.	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Angeles (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
Los Angeles (w'house)	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn. 1-3% Si) Carlot per gross ton, $52, Palmerton, Pa., $56, Pittsburgh; (16% to 19% Mn.) $1 per ton lower. **Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, Alloy, W. Va., Welland Ont., Sheridan, Pa., and Lynchburg, Va.; $147 Johnstown, Pa., mill. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $148 fob Aetna, Pa. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l. Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c, for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c, for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c. Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si, carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

(*Please turn to Page* 168)

Metal Supplies Remain Tight

Copper users continue to press for coverage despite the advance by all sellers to the 23.50-cent level. Labor difficulties hamper operations at lead and zinc properties

New York—Price tone of major nonferrous metal markets remained strong last week. Kennecott Copper Co. announced that it is selling copper at 23.50c a pound, the same level to which other leading producers had lifted prices in the preceding week. Red metal scrap prices moved higher in all leading markets.

Copper—The advance in electrolytic copper to the 23.50-cent level has not resulted in any lessening in demand. All leading producers reported last week that inquiry was well in excess of available supplies. Authorized shipments of copper to countries participating in the European Recovery Program from Apr. 3 to Aug. 9 totaled 48,122 long tons of copper valued at $23,627,660, according to the Economic Co-operation Administration.

Following the advance in the primary market, scrap prices moved sharply higher and resulted in larger shipments.

Lead—Labor difficulties continued to restrict the amount of lead available in the market last week. Producers continued to allocate supplies to customers on the basis of 19.30c to 19.35c, St. Louis.

Total stocks of lead held by smelters and refiners as of July 1 totaled 123,205 tons compared with 122,689 tons as of June 1. The tonnage in ore and matte and in process at smelteries increased to 71,092 tons from 69,901 tons while stocks in base bullion at smelteries and refineries declined sharply to 8380 tons from 13,881 tons. Tonnage in process at refineries increased to 15,752 tons from 12,799 tons on June 1. Stocks of antimonial lead increased to 5842 tons on July 1 from 5405 tons on June 1.

Imports of refined lead by the United States during June totaled 11,145 tons compared with 17,754 tons tons in May, according to the American Bureau of Metal Statistics. Total imports during the first six months amounted to 90,370 tons compared with 80,963 tons in the like 1947 period.

Zinc — Strikes at two midwestern zinc rolling mills last week aggravated an already tight market. Fabricators are still pressed to meet the demands of their customers. In the primary market, prime western zinc remained strong on the basis of 15.00c, East St. Louis. Unfilled foreign inquiry assures a tight market for some time to come. Smelter production of zinc totaled 69,828 tons in July, or at a daily rate of about 2252 tons compared with 2282 tons in May. This is the smallest daily rate since August of last year. Shipments to domestic consumers amounted to 61,469 tons in July compared with 61,138 tons in June. Export and drawback shipments declined to 4190 tons from 8023 tons in June, while 1838 tons of zinc were transferred from OMR stocks to the permanent government stockpile. Stocks of slab zinc at the end of July totaled 45,605 tons, compared with 43,280 tons at the end of June.

Tin—Shipments of Malayan tin in July amounted to 4325 tons, of which 1105 tons were from Singapore and 3220 tons from Penang. Of the July shipments, 2150 tons came to the United States, 1055 tons to continental Europe, 745 tons to India, and 300 tons to Canada. This brought Straits shipments for first seven months to 27,270 tons, of which the United States received 17,650 tons; continental Europe, 3879 tons.

Exports of Bolivian tin ores and concentrates in June contained 2964 tons of fine tin compared with 3165 tons in May.

International Tin Committee has made interim allocations of 1450 tons tin for the second half of 1948 to eight areas. These are in addition to the 28,685 tons previously allocated and announced earlier. The interim allotments follow in long tons: German Bizonia, 500; Brazil, 420; Egypt, 165; Finland, 100; Hong Kong, 65; South Africa, 160; Ceylon, 20; Korea, 20.

Permits Tin Alloy Imports

Washington— A new policy of authorizing imports of limited quantities of tin-bearing alloys under conditions designed to restrict such imports to a minimum, has been announced by the Department of Commerce. Previously, no such imports have been permitted.

Total tin supplies in this country will be increased "only to a negligible extent," department officals said, since private imports of the alloys will act to reduce pig tin allocations made to the United States by the international Combined Tin Committee.

It was pointed out that the Combined Tin Committee allocates pig tin only and that to qualify for an allocation, each participating country must file full information on its stocks, consumpton, requirements, and receipts of tin, whether in pig or semi-fabricated form. If the information discloses receipts of tin in other than pig form, the requirements of the country in question are reduced proportionately.

Thus, allocations of pig tin to this country will be cut to the extent that tin-bearing alloys are imported. (All pig tin allocations to the U. S. are purchased by the government and distributed to consuming industries by the Department of Commerce, under conservation order M-43.)

Another reason for holding imports of tin-bearing alloys to a minimum, the department said, is the fact that large United States purchases would deprive other countries of these alloys, and so increase overall requirements for pig tin. Current world supplies of tin are not sufficient to meet demand, and only a portion of the requirements of any country can be satisfied.

Conditions to govern granting of authority to import tin-bearing alloys are as follows:

Limits on material to be imported: less than 90 per cent tin contained; in pig or ingot form only; material may not be of such nature as to be considered especially prepared for a nonpermitted use.

Conditions to be met, if import license is to be granted:Quantity in any one month must fall within the total quantity of imports (250 tons of tin contained per quarter) established by the Department of Commerce (excessive applications will be denied or reduced); importees must certify to a firm offer of material by a supplier to the importer, and country of origin. Copy of export license (or certification as to license number, date, etc.) from country of origin, where required by said country, must accompany (or be stated in) application for import license.

Import license application must show: Quantity of material; assay or assays ; U. S. customers to whom it is intended or contracted to sell; quantity to each.

Tin units contained in the material will be charged against the U. S. customer's allocation of pig tin in month or quarter in which material is received.

The material may be used only in accordance with the provisions of order M-43.

Material may be imported only by or for customers who now receive pig tin allocations and can use the material in the form imported.

Import license applications (form OMD-1041) must be sent to the Tin and Antimony Sections, Nonferrous Metals and Minerals Division, Office of Domestic Commerce, Room 1431, Tempo "T" 14th and Constitution Ave., Washington 25, D. C.

Consideration will be given to all applications covering the third quarter in the hands of the Tin and Antimony Section on Aug. 16, 1948. A deadline for the receipt of applications for subsequent quarters will be announced later.

Confer Abroad on Metals

Washington — Conferences will begin this week in Europe to give effect to the Foreign Aid Act's machinery for transferring strategic materials to the United States, according to the Economic Co-operation Administration.

A group of United States representatives, headed by Evan Just, director, ECA's Strategic Materials Division, will meet with the Paris staff of W. Averell Harriman (United States special representative in Europe), with ECA special missions in Paris and London, and with British and French officials.

The talks will revolve around filling United States stockpiling and other needs for such materials as copper, tin, lead, chromite, and manganese.

The Foreign Aid Act requires that Marshall Plan countries "wherever applicable" facilitate transfer to this country of available strategic materials, considering domestic requirements and commercial export requirements of the countries concerned. The act also provides thet ECA funds may be made available to increase production in participating countries of materials in which the United States is deficient.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½ Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

Lead: Common 19.30-19.35c chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00-16.00c, pigs 13.50-15.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, $2.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 37-18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality 34.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

Seamless Tubing: Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

Wire: Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.45; best quality brass 34.92.

ALUMINUM

Sheets and Circles: 2c and 3c mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	25.9	...	...
0.135-0.096	12-48	26.4	...	...
0.095-0.077	12-48	26.9	25.0	28.6
0.076-0.068	12-48	27.5	25.2	28.8
0.067-0.061	12-48	27.5	25.2	28.8
0.060-0.048	12-48	27.7	25.4	29.1
0.047-0.043	12-48	28.1	25.6	29.4
0.042-0.038	12-48	28.1	25.6	29.4
0.037-0.030	12-48	28.5	26.0	29.9
0.029-0.024	12-48	28.9	26.3	30.3
0.023-0.019	12-36	29.5	26.7	30.8
0.018-0.017	12-36	30.1	27.3	31.6
0.016-0.015	12-36	30.8	27.9	32.5
0.014	12-24	31.7	28.7	33.6
0.013-0.012	12-24	32.6	29.4	34.5
0.011	12-24	33.6	30.3	35.7
0.010-0.0095	12-24	34.6	31.3	37.0
0.009-0.0085	12-20	35.8	32.4	38.5
0.008-0.0075	12.20	37.1	33.6	40.1
0.007	12-18	38.5	34.9	41.9
0.006	12-18	40.0	36.2	46.0

*** Minimum length, 60 inches. † Maximum diameter, 24 inches.**

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round R317-T	Round 17S-T	Hexagonal R317-T	Hexagonal 17S-T
0.125	45.0	47.0	...	...
0.156-0.203	38.5	40.0	...	...
0.219-0.313	35.5	37.0	...	...
0.344	34.0	36.00	...	...
0.375	33.0	35.5	42.5	43.0
0.406	33.0	35.5	...	...
0.438	33.0	35.5	42.5	43.0
0.469	33.0	35.5	...	...
0.500	33.0	35.5	42.5	43.0
0.531	33.0	35.5	...	...
0.563	33.0	35.5	40.5	40.5
0.594	33.0	34.5	...	...
0.625	33.0	35.5	40.5	40.5
0.656	33.0	35.5	...	...
0.688	33.0	35.5	40.5	40.5
0.750-1.000	32.0	34.5	37.0	38.0
1.063	32.0	34.5	35.5	36.5
1.125-1.500	31.0	33.5	35.5	36.5
1.563	31.0	33.5	...	35.5
1.625	30.0	32.5	34.5	35.5
1.688-2.000	30.0	32.5	...	...
2.125-2.500	29.5	31.5	...	...
2.625-3.375	28.5	30.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, **$23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles** and segments. Pipe: Full coils, $22.50 per cwt; cut coils, $22.75. Traps and Bends: List price plus 70%.

ZINC

Sheets, 19.50-20.00c, fob mill, 36.00 lb and over. Ribbon zinc in coils, 18.25c-19.00c, fob **mill, 36,000 lb and over. Plates, not over 12-in., 17.25c;** over 12-in., 18.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes,45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 31.84c; oval, 31.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; **fob Cleveland. Add 1 cent for rolled depolarized.**

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbls. 24.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.000	17.750	17.125
Commercial Bronze			
95%	20.125	19.875	19.375
90%	19.750	19.500	19.000
Red brass			
85%	19.750	19.500	19.000
80%	19.500	19.250	18.750
Best Quality (71-79%)	19.000	18.750	18.250
Muntz Metal	17.250	17.000	16.500
Nickel, silver, 10%	19.625	19.375	9.813
Phos. bronze, A.	22.625	22.375	21.375
Naval brass	17.750	17.500	17.000
Manganese bronze	17.750	17.500	16.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.75, No. 2 copper 18.75, light copper 17.75, composition red brass 17.00, auto radiators 14.00, heavy yellow brass 12.00, brass pipe, 12.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.37½, No. 2 copper 19.25, light copper, 18.25, refinery brass (60% copper), per dry copper content 18.12½.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.00-8.25, new brass clippings 13.50-14.00, No. 1 brass rod turnings 10.50-11.00, light brass 7.25-7.75, heavy yellow brass 9.75-10.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 11.00-11.50, cocks and faucets 10.75-11.00, brass pipe 10.75-11.00.

Lead: Heavy 17.00-17.50, battery plates 11.00-11.50, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed bobbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 6.25-6.75, old die cast scrap 4.00-4.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.50-13.00, old sheets 11.00-11.50, crankcases 11.00-11.50, borings and turnings 5.50-6.00, pistons, free of struts, 11.00-11.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July Avg.	21.574	17.621	12.444	103.00	15.500	35.000	35.833	74.625
Aug. 2-9	21.50-23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625
Aug. 10-12	23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 & 3 Bundles	42.50-43.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	38.00-38.50
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	38.50-39.00
Bar Crops and Plate	49.00-49.50
Low Phos. Steel	49.00-49.50
Heavy Turnings	**39.50-40.00**

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Machinery Cast	72.00-73.00
Charging Box Cast	59.00-60.00
Heavy Breakable Cast.	57.00-58.00
Malleable	**69.00-70.00**
Brake Shoe	**55.50-56.00**
Clean Auto Cast	**58.00-59.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	**75.00-80.00**
Axles	55.00-56.00
Rails, Rerolling	58.00-59.00
Rails, Random Lengths	**54.00-56.00**
Rails, 3 ft and under	61.50-62.50
Rails, 18 in. and under	**62.50-63.50**
Railroad Specialties	59.00-59.50
Uncut Tires	54.50-55.00
Angles, Splice Bars	**53.00-54.00**

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	69.00-71.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	73.00-75.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	60.00-61.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	51.00-53.00
Angles, Splice Bars	57.00-58.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings.	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings.	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings.	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	57.00
Charging Box Cast	45.00
Heavy Breakable Cast.	56.00
Stove Plate	50.00
Unstripped Motor Blocks	50.00
Brake Shoes	48.00
Clean Auto Cast	57.00
Drop Broken Cast	65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	70.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	61.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turning	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast.	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$45.50-47.00
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings.	38.75-39.25
Low Phos.	46.00-47.00

Cast Iron Grades

No. 1 Cupola	69.00-70.00
Mixed Cupola	63.50-64.00
Heavy Breakable Cast.	**55.00-57.00**
Malleable	**70.00-75.00**
Clean Auto Cast	**62.00-64.00**

Railroad Scrap

Rails, 3 ft. and under	**60.00-61.00**
Railroad Specialties	52.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-46.00
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings.	38.50
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	48.50-49.00
Elec. Furnace Bundles	46.00-47.00
Heavy Turnings	44.50-45.00
No. 1 Chemical Borings	**42.00-43.00**

Cast Iron Grades

No. 1 Cupola Cast	**63.00-65.00**
No. 1 Machinery Cast.	**67.00-68.00**
Charging Box Cast	62.00-63.00
Heavy Breakable Cast.	62.00-63.00
Unstripped Motor Blocks	**59.50**
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	33.00-33.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles.	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	56.00-57.00
Heavy Breakable	56.00-57.00
Unstripped Motor Blocks	**52.50-53.50**
Malleable	**68.00-69.00**

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$36.40-37.40
No. 2 Heavy Melt. Steel	34.40
No. 1 Bundles	34.40
No. 1 Busheling	34.40
Machine Shop Turnings	29.40
Mixed Borings, Turnings	29.40
Short Shovel Turnings	31.40
Bar Crops and Plate	38.00-39.00
Punchings & Plate Scrap	38.00-39.00
Chemical Borings	33.50

Cast Iron Grades

No. 1 Cupola Cast	60.00-62.00
Heavy Breakable Cast	53.00-55.00
Stove Plate	52.00-54.00
Unstripped Motor Blocks	45.00-46.00
Clean Auto Cast	53.00-55.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	39.00-39.50
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	69.00-71.00
Clean Auto Cast	69.00-71.00
No. 1 Wheels	62.00-63.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	47.00-48.00
Malleable	79.00-80.00
Rails, Rerolling	64.00-64.50
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	60.00-61.00
Rails, 18 in. and under	61.00-62.00
Railroad Specialties	56.00-57.00
Angles, Splice Bars	55.00-56.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$44.00-45.00
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	35.00-36.00
Short Shovel Turnings	36.50-37.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	60.00-61.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	71.00-72.00
Rails, Rerolling	63.00-65.00
Rails, Random Lengths	56.00-59.00
Rails, 3 ft. and under	60.00-61.00
Uncut Tires	51.00-52.00
Angles, Splice Bars	54.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	**$37.50**
No. 2 Heavy Melt. Steel	**37.50**
No. 1 Busheling	**37.50**
Nos. 1 & 2 Bundles	**37.00**
No. 3 Bundles	**35.00**
Long Turnings	**24.50**
Short Shovel Turnings.	**26.00-27.00**
Cast Iron Borings	**25.00**
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	**38.00**
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	**$26.00**
No. 2 Heavy Melt. Steel	**26.00**
No. 1 Busheling	**26.00**
Nos. 1 & 2 Bundles	**22.00-23.00**
No. 3 Bundles	**22.00-23.00**
Machine Shop Turnings	**19.00-21.00**
Mixed Borings, Turnings	**19.00-21.00**
Punchings & Plate Scrap	**26.00-28.00**
Cut Structurals	**26.00-28.00**

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	**22.00**
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	**$25.00**
No. 2 Heavy Melt. Steel	**25.00**
Nos. 1 & 2 Bundles	**25.00**
Machine Shop Turnings	**16.00**
Mixed Borings, Turnings	**15.50-16.00**
Punchings & Plate Scrap	**28.00**
Elec. Furnace Bundles.	**28.00**

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-43.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Steel Bars . . .

Bar Prices, Page 144

New York—Hot-rolled carbon bar producers are now opening their books for shipments beyond the end of this quarter, although they are setting up allotments for the entire fourth quarter in only a few instances. Where action has been taken, bookings are principally for October tonnage. Producers are moving slowly because they do not yet know where they stand with respect to voluntary allocation programs. Some say that it may be near the end of this month before they will have a sufficiently good idea to permit them to go ahead for the remainder of the year. The average consumer likely will receive less tonnage in the fourth quarter, because of greater voluntary allotment requirements.

Sellers of cold-finished bars have been looking beyond the current quarter for some time and in general are out of the market for the remainder of this year on all sizes. In certain instances, cold finishers are booked ahead several weeks into next year on some sizes. Alloy bar deliveries are becoming increasingly extended, with some producers out of the market for 1948, except on electric furnace grades. Relatively little of even these grades is available this year in either hot or cold-rolled steel.

Boston—Price spreads in carbon and alloy bars are sufficiently broad for delivery at some points to indicate considerable shifting in sources of supply once an approach to normal distribution is reached. At Hartford, Conn., carbon bars can be delivered from Bethlehem $4.80 ton under Pittsburgh and other producing points taking a 67-cent per 100 pound freight. The spread at Worcester is $2 from Buffalo and $4 from Bethlehem; Boston, $2 from Buffalo; Providence, $1,20 from Buffalo; Portland, $1.40 from Buffalo; Bath, Me., $1.60 from Buffalo.

Philadelphia—Cold drawers are virtually sold up for the remainder of this year and, with one or two exceptions, are booking tonnage for next year's delivery. Sellers of hot carbon bars, however, are only now beginning to open books for fourth quarter, with some taking no action beyond the first month because of uncertainty with respect to the scope of preference needs under voluntary allocation programs.

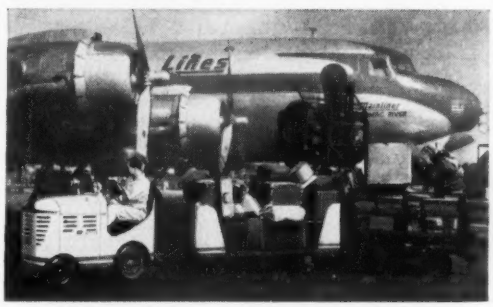
Stainless Extras Revised

Adjustments cover quantity, packaging, size, gage and finish extras

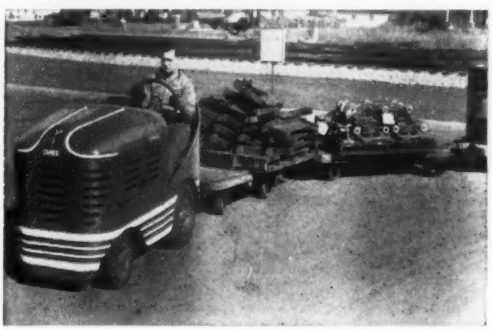
Pittsburgh—Carnegie-Illinois Steel Corp.'s stainless steel prices increase, averaging 9.25 per cent, represented upward adjustments in base prices and revisions in packaging, quantity, size, gage and finish extras. The new extras more accurately reflect actual production costs and, therefore, were not uniformly adjusted throughout the list. Some extras held unchanged, while some quantity extras were reduced.

Jessop Steel Co., Washington, Pa.,

MATERIAL HANDLING News



Trailer-loads of luggage, mail and express are hauled swiftly by the Clarkat to a waiting air liner.



On their way to storage a Clarkat hauls trailers loaded with castings, machined parts, drums and miscellaneous items.

Mass handling of palletized units on trailers is an easy, natural job for the Clarkat.

This compact package of pulling power "delivers the goods," at low cost

The CLARKAT

Thorough, thoughtful analysis of performance records of towing tractors used in Industry leads you inevitably to the husky, nimble Clarkat.

Hauling huge tonnages of material by the trailer-train-load—using its squared nose to bulldoze heavy units into position—handling the numerous heavy-pull jobs common to most busy plants: the Clarkat has made an extraordinary record for efficient and economical performance wherever it has been put in service.

Only an experience like Clark's—30-odd years of resourcefulness in evolving modern materials handling methods and machines—could produce the Clarkat.

Exceedingly important is the exclusive and flexible center-pivoted suspension of the full-width steering axle—a guarantee of smooth, safe travel over rough surfaces. It's easy to handle, easy on the driver, easy to steer.

It is built in two models:

- Clarkat "20"—drawbar pull 2000 pounds, towing capacity 42 tons.
- Clarkat "26"—drawbar pull 2600 pounds, towing capacity 58 tons

It is gas-powered, with either solid or pneumatic tires. For still heavier hauling the Clarktor "6" is recommended; built in four models with towing capacities of 47, 68, 90 and 104 tons respectively.

A knowledge of this husky, hustling worker rates high as vital business information. To explore how it will speed up your production with substantial savings, get the objective survey and recommendation of a Clark field representative.

It's always "good business" to CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 26, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

–it's from HERE to HERE

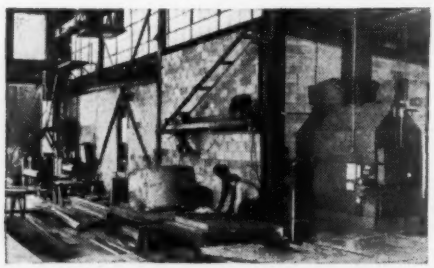
● It's an easy matter to define the "comfort zone" in a plant. It's that eight or ten feet above the floor that must be heated for employee comfort. But it's quite another matter to heat it economically and effectively when thirty feet of air space extend above it to the roof.

Such a problem faced the Minweld Steel Company in its new fabricating plant in Pittsburgh—and a Dravo *Counterflo* Heater solved it for them.

This powerful unit discharges warm air above the heads of the workers, circulates it through the working area, and returns it without drafts to the base of the heater for reheating and recirculating. This method maintains uniform heat throughout the 6,500 square foot working area—even though two 19-foot square truck doors open at each end, and metal-siding walls are broken by an abundance of windows.

Installation of the self-contained Dravo *Counterflo* Heater required only a fuel line, a power line and a small venting stack—no boiler room or piping. Ductwork, too, is unnecessary because capacity is ample to blanket a radius of 250 feet completely and *evenly* with warm air. The unit is entirely automatic . . . it is shut off at night—and at 6 A.M. the watchman simply flips a switch and the plant is warm fifteen minutes later.

Bulletin IT -516 contains valuable information about the Dravo *Counterflo* Heater which you can apply to your own heating problems. Write for it, Heating Section, Dravo Corporation, Dravo Building, Pittsburgh 22, Pa.



In a fabricating plant such as Minweld Steel Company, man-hours and efficiency are vitally important. "In a recent two week period," Owner William Minnotte says, "we estimated a saving of twenty man-hours because our men didn't have to stop work and try to get warm around old-fashioned coal stoves. Increased productivity, of course, is also tied to the increased comfort of our employees."

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs

DRAVO CORPORATION

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK
CHICAGO • ATLANTA • BOSTON

Sales Representatives in Principal Cities

Mfd. and sold in Canada by: Marine Industries, Ltd., Sorel, Quebec

took similar price action Aug. 9, on stainless plates, sheets and bars.

Republic Steel Corp., Cleveland, had by Aug. 12 made no change in its prices on stainless steels.

New base prices (for range of sizes, grades and finishes produced at Carnegie's plants in Chicago and Pittsburgh districts) for a few selected product grades in dollars per 100 pounds are presented in following tables:

	Sheets		Plates	
Grade:	New	Old	New	Old
301	37.50	37.00	32.00	29.50
302	37.50	37.00	32.00	29.50
303	39.50	39.00	34.00	31.50
304	39.50	39.00	34.00	31.50
309	52.00	51.00	46.00	43.50
316	53.00	52.00	50.50	48.00
321	45.50	44.50	39.50	37.00
347	50.00	49.00	44.00	41.50
403	36.00	32.00	29.50	27.00
410	33.00	29.00	26.00	23.50
416	33.50	29.50	26.50	24.00
430	35.50	31.50	26.50	24.00
501	24.00	17.50	15.50	13.00
502	25.00	18.50	17.00	14.50

	H-R Strip		C-R Strip	
Grade:	New	Old	New	Old
301	24.25	22.00	30.50	28.00
302	25.75	23.50	33.00	30.50
303	30.00	29.50	36.50	36.00
304	27.75	25.50	35.00	32.50
309	41.00	40.50	52.00	51.00
316	46.00	43.50	55.00	52.00
321	34.50	32.00	44.50	41.50
347	38.75	36.00	48.50	45.50
403	26.50	23.00	33.50	29.50
410	21.25	18.50	27.00	24.00
416	28.00	20.00	33.50	25.50
430	21.75	19.00	27.50	24.50
501	16.50	13.00	22.50	18.50
502	17.50	14.50	23.50	19.50

	Shapes—Hot and C-F Bars		Forging Billets	
Grade:	New	Old	New	Old
301	28.50	26.00	26.50	22.50
302	28.50	26.00	26.50	22.50
303	31.00	28.50	28.75	24.00
304	30.00	27.50	27.75	23.00
309	41.50	39.00	38.50	33.50
316	46.00	43.50	42.75	37.00
321	34.00	31.50	31.50	27.00
347	38.50	36.00	35.75	30.50
403	26.00	23.50	24.25	20.00
410	23.00	20.50	21.50	17.50
416	23.50	21.00	21.75	17.50
430	23.50	21.00	21.75	17.50
501	11.50	9.00	10.75	8.00
502	12.50	10.00	11.75	9.00

Grade:	Rerolling† Ingots	Slabs Billets	Forged Discs,† Die Blocks, Rings
301	12.75	17.00	30.50
302	13.50	18.25	30.50
303	15.00	20.25	33.00
304	14.50	19.25	32.00
309	21.50	28.75	44.50
316	22.75	30.25	49.00
321	18.25	24.50	36.50
347	20.00	26.75	41.00
403	13.75	18.50	27.50
410	11.25	15.00	24.50
416	13.75	18.50	25.00
430	11.50	15.25	25.00
501	9.25	12.50	12.00
502	9.75	13.00	13.00

† Formerly did not quote.

Adjustments in extras include the following new quantity breakdown and upward revision of extras in dol-

lars per 100 pounds for the various products:

Pounds	Quantity Extra ($ per 100)
10,000 and over	None
Under 10,000 to 8000	2.00
Under 8000 to 5000	4.00
Under 5000 to 3000	7.00
Under 3000 to 2000	9.00
Under 2000 to 1000	10.00
Under 1000 to 500	12.00
Under 500 to 300	14.00
Under 300 to 100	18.00
Under 100	23.00

Formerly there was a quantity extra charged between 10,000 and 40,000 pounds, with no extra for over 40,000 pounds. The new extra list eliminates these charges, which formerly amounted to $1.75 per 100 pounds on shipments between 10,000 and 20,000 pounds and $1.25 for shipments between 20,000 and 40,000 pounds.

Revisions in packaging extras in dollars per 100 pounds are as follows:

SHEETS—Boxing, $2.50; burlapping, paper wrapping, skid or platform packing 75 cents for 5000 pounds or more per skid, $1.25 for under 5000 pounds; minimum charge per package is $7.50. No distinction now is made in packing extras for domestic or export shipments. Extras for paper protection per side on polished sheets only have been increased from $2.25 up to $12, depending on the gage classifications, which also have been adjusted. An extra of $24 for gages 29 and 30 has been added to this extra table.

PLATES—Boxing extras similarly were raised from $1.25 to $2.50; and minimum charge per package from $2.25 to $7.50. These charges also apply on export shipments.

HOT-ROLLED BARS—Boxing extra, for domestic shipments, was increased from 75 cents to $1.50 and minimum charge per package is now $5. For single boarding or burlapping, there is a minimum charge of $1 or 50 cents per 100 pounds against 50 cents or 25 cents formerly. Similar adjustments have been made for cold-finished bars and wire except minimum charge for boarding or burlapping is $1 or $1 per 100 pounds; for burlapping as required by the railroads the minimum charge is $1 or 50 cents per 100 pounds.

HOT-ROLLED STRIP — Boxing, $1.50; burlapping $1; minimum charge per package $5. Same packaging charges are made on cold-rolled strip. These formerly were 75 cents, 50 cents and $2.25 respectively.

Changes in the sheet gage and finish extras include a revision in the thickness ordering ranges and establishment of gage extras for unpolished finishes only of $1 to $6 per 100 pounds for gages 15 through 21; extras for the lighter gages have been increased up to nearly $20. Company's new extra card shows combined gage and polishing extras, one and both sides, for only No. 4 finish. Advances in these extras, applicable to one side, range up to $12 per 100 pounds for gages 15 through 26, with a new schedule of extras shown for gages 27 through 30. Upward revisions in extras throughout the full gage range of 8 through 30 also have been put into effect on the combined

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● These features insure quiet, smooth operation with maintenance cost close to the zero point and exceedingly low depreciation, even under very heavy shock loads and other difficult conditions of service.

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gage and polishing extras for both sides on No. 4 finish.

Footnote regarding circles has been revised to read as follows: Add 33 1/3 per cent to the specific product price after all extras except those for packing have been applied. Formerly 30 per cent was added.

Thickness and width ranges for the width and gage extras applicable to hot-rolled strip coils, plus corresponding charges, have been revised to more accurately reflect present consumer requirements and mill operating practice. These extras now apply only on thickness 0.095 inch and heavier, and new width ranges with extra charges are as follows: 3 to 6-inch, inclusive, $3.50; over 6 to 12-inches, $3; over 12 to 18-inches, $2.50; and over 18 to 24-inches, exlusive, $1.75 per 100 pounds. Formerly no extra was charged in width range of 3 to 18-inches, inclusive. All references to testing and physical properties under hot-rolled strip also will be deleted in the new extra card.

Cold-rolled strip cut-lengths size extras for widths over 18 to 24-inches, exclusive, have been revised upward in thickness ordering range of 0.064 to 0.020-inch, and for thickness 0.011 to 0.010-inch. Upward adjustment also has been made for width range 3 to 6-inches, inclusive, within order thickness 0.049 to 0.035-inch. Increases in these extras range from 50 cents to $3.75 per 100 pounds.

Footnote in reference to forging billets has been revised as: When cold cut to exact length, add full stainless extras for wastage; formerly one-half stainless extras were added.

Special chromium content extras for USS 5 stainless steel have been increased 25 cents. There is a flat charge of $2.25 per 100 pounds for pickling. Wording under the heading additional extras for 5 per cent chromium steels has been revised to "full" stainless extras instead of "one-half" as previously.

Extras applicable to rerolling ingots, slabs and billets will be quoted on application.

Stainless Steel . . .

Stainless Steel Prices, Page 145.

Cleveland—American Steel & Wire Co., this city, has announced new mill prices on all of its stainless steel products which reflect approximately 9¼ per cent advance over prices which have been in effect since April, 1946. The new prices became effective with shipments made on or after 12:01 a.m., Aug. 9, and apply to the range of sizes, grades, finishes and specifications produced at its plants.

Concurrently, revised extras for packing, quantity and certain sizes will be placed in effect. Delivered prices reflecting actual transportation charges to destination will also be quoted.

Cincinnati—Armco Steel Corp. has announced an increase of 10 per cent on all stainless steel products. The rise applies to mill prices, extras and packing charges. Sheet mills in the district are holding to original third quarter allotments but foresee supply uncertainty in the prospective drain on tonnage in the voluntary priority program.

Atlantic Steel Revises Prices

Atlanta, Ga.—Atlantic Steel Co. announced new price schedules effective as of July 17. The prices which apply for shipment in carlots, f.o.b. cars, the company's plant in this city, are as follows: Hot-rolled merchant bars, $4.10 per 100 pounds; bar size angles and small shapes, $4.25; channels and other sections, now priced on a commodity base, will be quoted upon application; hot-rolled strip steel, $3.45. The following prices apply on wire products for shipment to dealers: Bright, galvanized and cement-coated nails and staples, column 110; annealed merchant quality wire, $5.20 per 100 pounds; galvanized merchant quality wire, $5.65; barbed wire, column 126; woven wire fencing, column 121; single loop bale ties, column 110 for straight carload and column 115 for mixed carload; manufacturers wire, $4 per 100 pounds.

Washers are being quoted at "list," f.o.b. Atlanta, and are the same as those quoted on the price sheet dated July 15, 1935. The company's current basis on rivets, effective as of July 17, is 55 per cent off its standard list, on sizes 7/16th in diameter and smaller and $6.65 base per 100 pounds on ½-inch and ⅝-inch structural rivets. These prices are f.o.b. Atlanta, Ga., for shipment in straight, mixed or less carlots, and all prices are subject to change without notice.

Sheets, Strip . . .

Sheet Prices, Page 144

New York—Some sheet sellers have set up quotas for October and plan to go through the entire fourth quarter on a month-to-month basis. Others, even including some who have established allocations for October, plan to switch over to a quarterly basis just as soon as they know more accurately where they stand. Principal drawback at present is uncertainty with respect to voluntary allocation programs—programs which will in all probability result in a curtailment in the receipts of average buyers, as compared with the current quarter.

Quotas will also reflect further withdrawal of inland mills from the local market, as a result of recent switch to the mill pricing system. However, one leading Pittsburgh producer claims his quotas will in no way be affected by this consideration; that his pattern of distribution here as well as amounts involved will be unchanged, except as a result of increasing demands for voluntary allocation programs.

One midwestern independent mill reports that due to a combination of circumstances it will have no cold-rolled steel for distribution here in fourth quarter and very little hot-rolled, except for railroad requirements. However, this producer has been tapering off on shipments into this district for some time.

On various specialties, sheet producers have been selling ahead for some time. As a result, there is little tonnage of electrical sheets, for instance, now available for shipments over the remainder of this year. Sellers of stainless sheets are booked ahead 8 to 12 weeks.

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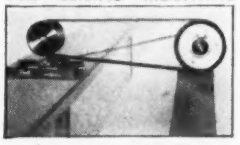
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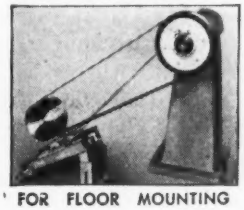
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stainless was action by a large producer in eliminating jobber discounts. Whether this move will be subsequently taken by others remains to be seen. In general, it is said, jobber discounts on stainless have amounted to about 10 per cent on sheets, bar and wire and 5 per cent on strip.

Boston—Users of low carbon cold-rolled strip have not yet fully realized impact of higher prices and differentials with the removal of the base from Worchester to New Haven by the largest producer. Some cold strip is still based at Worchester. but the reprecussions for central Massachusetts are considerable. At Gardner, Mass., for instance, the price delivered from New Haven is higher than from the Cleveland district. Mills on a monthly basis are filling November schedules and there is no easing in demand. Reaction to higher prices is not vociferous, but there is some grumbling with doubt as to ability to pass on higher costs in all finished products. Sheet inventories are low and with fourth quarter allocations about to be assigned, no improvement is likely. Allocations in most cases have been delayed by growing requirements for voluntary allocations programs. One of the sharpest increases is in galvanized sheets, the last thrust upward following an advance in zinc accompanied by new extras varying as to gage; the more popular gages are around $20 ton higher than in second quarter.

Philadelphia—Although some sheet sellers have not as yet opened their books for fourth quarter, others have set up quotas for October. Indications are that some mills will proceed on a month-to-month basis for the entire period. Action in general is being delayed pending further clarification as to tonnage required under voluntary allocation programs.

Pittsburgh—An unusual situation prevails in cold-rolled strip pricing with non-integrated interests quoting premium prices of $5 to $10 a ton to offset increased wages and higher hot-rolled strip prices. This situation prevails in high as well as cold-rolled strip ranges. In low carbon range a price spread of $4.25 to $5 is quoted among leading producers.

Integrated interests have not followed Jones & Laughlin's action in classifying cold-rolled sheets under 23 inches wide as cold-rolled strip. One producer is reported pricing narrow cold-rolled strip under commodity band price schedule. Jessop Steel has followed Carneige-Illinois in revamping stainless steel extras to more accurately reflect operating costs.

Chicago—Modernization and speed-up of Inland Steel Co.'s cold-reducing units at Indiana Harbor will result in increased supply of cold-rolled sheets and will permit the company to accept conversion tonnage for cold-rolling. Conversion presently is being accepted only on the hot-rolling mills and customers who want cold-rolled sheets on this basis now need to find further conversion sources. When the expanded facilities are brought into full production next year conversion customers will find their finished steel costs reduced materially. Chicago area customers, in sizing up the ultimate effect of the change in pricing method, hope it will eventually mean an increase in the amount of steel available to this district. They reason that Pittsburgh mills will move more tonnage to the Midwest than previously, as New York and New England consumers will find the Sparrows Point producer able to quote its delivered prices below those of competitors. Sheet and strip consumers here are generally reported to be operating at satisfactorily high levels.

St. Louis—Sheet production here continues to waver between 40 and 50 per cent of capacity as Granite City Steel Co. struggles to adjust auxiliary equipment in its new cold rolling mill. With its temporarily-reduced pig iron supply and poor quality scrap, the firm says it could not produce the ingots for 100 per cent rolling operations even were its equipment troubles solved. Sheet demand is unremitting.

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Structural Shapes . . .

Structural Shape Prices, Page 145

Boston — Structural fabricating shops are estimating less tonnage, but in some instances are committed on more volume than is covered by nearby allocations. Most of the small tonnage contracts wanted for completion this year have been

placed. Standard structural delivered Boston from Buffalo have a $2 ton advantage over Pittsburgh, while from Bethlehem the spread is $3.80 lower.

New York — Despite increased costs, which have been especially reflected of late by the advances in steel prices, fabricators assert a substantial volume of work is still going ahead. The largest project in immediate prospect is the United Nations development here, involving two buildings requiring about 20,000 tons. Specifications may be issued this week, with bids likely to be closed around the middle of September, in the opinion of some leading fabricators.

Philadelphia—One large shape seller has set up quotas for October and is expected to take action on the remaining two months within the next week or ten days. The leading eastern producer had taken no action up to the time this issue went to press. Structural activity in the district is spotty with few outstanding inquiries on orders. However, fabricating shops have little capacity left for this year.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 144

Seattle—Rolling mills are operating at capacity under the pressure of heavy backlogs and an insistent demand for steel items in spite of rising costs. The call for reinforcing bars in small tonnages is overwhelming and management is compelled to refuse many offers in an effort to serve regular customers. Many large construction projects are pending. Immediate concern of the mills is to speed deliveries on backlogs.

Tubular Goods . . .

Tubular Goods Prices, Page 145

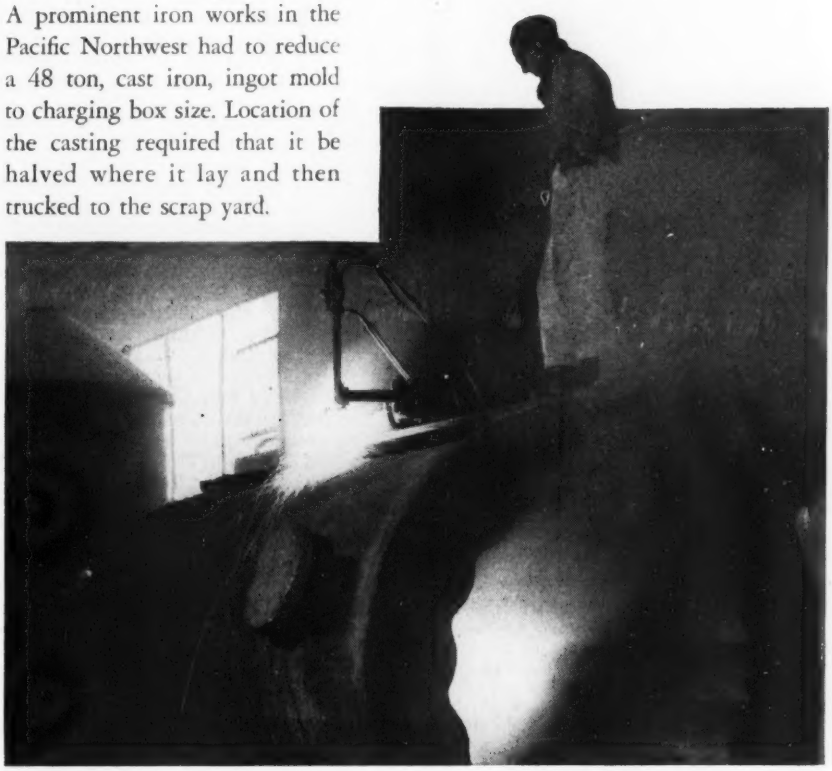
Pittsburgh—National Tube Co. advanced alloy pressure tubing prices Aug. 9, covering 5 per cent chromium analysis under schedule B-2 and schedule M covering pressure and mechanical tubing grades. Exact amount of increase per item was not made public up to last week. The company produces seamless stainless tubing at Gary, Ind., in range of ¼ to 8 inches, ⅜ to 8 inches at Elwood City, Pa. Welded stainless tubing is produced only at Gary.

Sharon, Pa.—To offset an increase of three cents per pound in zinc prices, Mercer Tube & Mfg. Co. increased galvanized butt weld standard pipe $7 a ton, or 3½-point lower discount. The company's new discounts on galvanized pipe are: ½-inch, 20; ¾-inch, 24; 1-inch, 27; 1¼-inch, 27½; 1½-inch, 28; 2-inch, 28½; 2½ and 3-inches, 29. Other tube manufacturers have not yet taken similar price action although the matter is under consideration.

Boston—Firm back orders with steel pipe distributors average about six months allocation at current levels; some are not now taking forward orders. Most distributors are reselling at the higher mill base rate or around $1.80 per ton over the Pittsburgh and Lorain delivered price while a few are allowing freight up to 25 cents per 100 pounds. Pipe fabricating shops are over-committed in some cases and are sold through 1949 based on current allocations.

48 ton, 15 inch thick ingot mold cut in 96 minutes

A prominent iron works in the Pacific Northwest had to reduce a 48 ton, cast iron, ingot mold to charging box size. Location of the casting required that it be halved where it lay and then trucked to the scrap yard.



L. R. Hayward, Airco Technical Sales Representative, suggested cutting with an Airco Radiagraph, equipped with a water cooled torch. A 2½ inch square billet, to be used as a waster, was placed the length of the 12 foot casting and the Radiagraph set for a forward speed of 1½" per minute. Fire clay was packed on both sides of the billet to keep the molten steel in the kerf. The oxyacetylene flame slashed thru the 15" thick casting and the 2½" waster at a speed that required only 96 minutes to make the 12 foot long cut.

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Plates . . .

Plate Prices, Page 145

Boston—With a substantial volume of plate production already earmarked for specific programs under voluntary allocation, the limited share for general distribution will soon be reduced further by shipbuilding requirements. New England yards, naval and private, have contracts for destroyers, submarines and conversions, taking an estimated 20,000 tons; nine submarines are included which are to be built by Electric Boat Co., Groton, Conn., and Portsmouth, N. H., navy yard. Two of four destroyers will be built at Quincy, supplementing the heavy building program on super tankers at that yard. Bath Iron Works has two destroyers. Indications are the shipbuilding demand will be notably strong on Bethlehem Steel Co. mills. Meanwhile shipments to freight car builders are at the rate of 10,000 cars per month and lower allocations to tank and other fabricating ships are indicated. Several additional plate consuming programs, notably barges and armament, while not heavy for the district, nevertheless narrow the volume remaining for general distribution.

New York—While some plate producers have made progress in getting caught up on current commitments, others anticipate carryovers at the end of this quarter will be heavier than at the end of last quarter. Pressure for tonnage has shown no abatement and some sellers fear they have again over-booked despite prospects of a steady production rate this quarter. This, combined with the fact that they will be called upon to supply more tonnage for voluntary allocation programs, has caused them to forecast that quotas for the final three months of this year will be lighter—at least for rank and file of customers. Most producers now are beginning to set up allotments for shipment after the end of this quarter, although not taking action for the entire fourth quarter.

Philadelphia—Plate washers are being advanced around 70 to 80 cents per 100 pounds.

Plate demand is active, with ship work adding to the pressure for tonnage as time goes on. A 65,000-ton airplane carrier has just been placed with a Norfolk, Va., yard, as one of 16 ships in the Navy's postwar program. Two antisubmarine cruisers are scheduled for construction in the local district, one at the New York Shipbuilding Corp.'s yard, Camden, N. J., and the other at the Philadelphia Navy yard. In addition to the 16 New ships on the Navy program, conversion work on 33 ships is being scheduled.

In merchant shipping, two passenger liners of 33,000 displacement tons each have been placed with the shipbuilding division of the Bethlehem Steel Corp. The ships will be operated in the Mediterranean Service of the American Export Lines, which made the award in co-operation with the United States Maritime Commission, which has agreed to a 45 per cent construction subsidy. The ships will be built at Bethlehem's Quincy, Mass., yard with keels to be laid next spring.

Pittsburgh—Substantial increase in

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plate requirements for barge construction is anticipated. Although this trend is seen dependent on final congressional action regarding steel mill pricing and more competitive market conditions. Dravo Corp. reports bookings of 10 welded steel coal barges from Ohio River Co. Cincinnati, making total of 40 such barges ordered by the company since the war ended.

St. Louis—An upsurge in the demand for plates has been noted here, but aside from a pipeline order which will take until December of 1949 to complete, this area is out of the plate-producing business. Prices of steel products here have not yet settled down to quotable f. o. b. figures. Producers generally are moving slowly pending an appraisal of the force of the cement case decision and of the effect on the midwest of prices set by eastern mills.

Birmingham—Plate demand continues heavy while supply has not materially improved, although most essential needs are being pretty well met. Shipbuilding has tapered off somewhat, but there is considerable repair work and the biggest backlog of car orders the district has ever known. Lighter plates are in somewhat better supply.

Wire . . .

Wire Prices, Page 145

Boston—Wire mills on monthly schedules are filling up for October with no slackening in demand for most products; there is no indication of any easing in allocations in the near future. Rods are the limiting factor. Screw shops continue to draw large diameter wire down to smaller and intermediate sizes, being short of rods, while heading wire inventories are low. Average increase cost of wire to consumers, including mill advances, higher differentials at Worcester, freight charges involved in mill pricing is better than $20 per ton. There are some slight differences in district mill prices, but Worcester faces sharper price competition with Sparrows Point and Johnstown mills in southern New England; Worcester is 4.45c on bright basic manufacturers wire compared with 4.25c, Sparrows Point, and 4.15c, Johnstown.

Pittsburgh—Page Steel & Wire Division, American Chain & Cable Co. at Monessen, Pa., has advanced stainless steel wire prices straight 10 per cent on base and extras. This is in line with price action taken by Allegheny Ludlum and differs from American Steel & Wire's 9¼ per cent advance involving revisions in packing size and quantity extra.

Semifinished Steel . . .

Semifinished Prices, Page 144

Pittsburgh—Westinghouse Electric Corp. has concluded arrangements with United Engineering & Foundry Co. whereby an idle acid open-hearth furnace at the latter company's WAA leased plant in New Castle, Pa., will be converted into a basic furnace for production of ingots. Westinghouse will defray some of the cost of putting this furnace into operation and will amortize this expenditure over ingots produced for conversion into finished steel.

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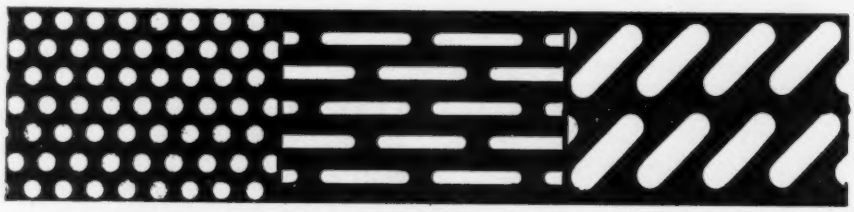

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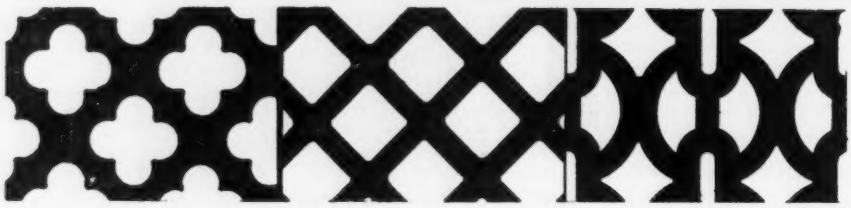

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Warehouse . . .

Warehouse Prices, Page 147

Boston—Warehouses are revising prices upward, but all have not completed their lists because of unsettled factors. Prices vary due to differences in sources of supply and freight charges. On some products, increases are sharp, notably galvanized sheets. Most distributors are selling structurals and plates 5.54c and 5.89c, Boston, respectively. Inventories on most standard carbon products are badly depleted with demand far in excess of supply; steel frequently moves out against back orders without going into stock. No improvement in tonnage is in sight for fourth quarter.

New York—While jobbers here are still making some price adjustments, the market is gradually becoming stabilized. Hot-rolled sheets, 10 gage, are quoted 5.73c to 5.80c for city and 5.53c to 5.60c for country; galvanized sheet, 10 gage, 7.74c to 7.83c for city and 7.54c to 7.63c for country. Cold-finished rounds are now established at 6.58c for city and 6.38c for country, with an extra of 50 cents on cold-finished squares and flats.

Philadlephia—Warehouse prices are becoming somewhat more stabilized. Not all distributors have issued new lists but have nevertheless gotten their schedules developed to a point where they soon should be doing so. Elimination of jobber discounts by one leading mill may be followed by similar action in other quarters. However, at least two producers of stainless have indicated they will probably do nothing at this time, but rather adhere to recently announced schedules.

Cincinnati—Principal warehouses, in setting up new price schedules, are quoting f.o.b. warehouse with intent to add actual delivery costs. Uniformity is lacking in the price schedules. Demand is, as usual, far beyond supply and mill shipments in general are down from recent levels.

Seattle—Jobbing houses report demand has held up well and a large turnover for the third quarter is expected. Some jobbing shops are down, but demand in manufacturing and construction industries is strong in the face of higher costs. Stainless steel items are up 10 per cent. Wholesalers are issuing temporary price lists until they can ascertain actual costs under the new system. Plates, sheets, small bars, rolled shapes and angles continue in short supply.

Pig Iron . . .

Pig Iron Prices, Page 146

Boston—Pig iron shortages are reflected in foundry curtailments. Some shops have received no iron this quarter and have slim hopes for any tonnage before October, if then. Appeals are being made to Washington and iron producers for more tonnage, and, while some iron may be scrapped together for this district, the general supply is so limited any substantial relief will be at the expense of other consumers.

New York—The Swedeland, Pa., producer is resuming shipments of merchant iron this week after a suspension of about 60 days for repairs, with prices newly advanced $5 a ton,

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"The savings effected in this one job alone are outstanding. Roto-Finish has enabled us to increase the production of one assembled unit from 94 units per day to 300 per day by releasing five regular operators who ordinarily would be assembling the units from a tedious filing job."

Unretouched illustration shows copper segment at top before Roto-Finish deburring and finishing; below after Roto-Finishing.

Roto-Finish is a mechanical deburring and finishing process — producing staggering savings in labor costs over manual operations. One operator can finish quantities of parts uniformly and accurately in a fraction of the time required by hand. Roto-Finish likewise removes a job that is tedious, time consuming and distasteful to employees. It eliminates need of elaborate, costly dust control systems. Send samples of die castings, sand castings, stampings, machined parts, forgings for processing. (Include finished part for guide.) No obligation!

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to $50 furnace for basic, $50.50 for No. 2 foundry and $51 for malleable. As a result of this resumption, district furnaces stand to receive more tonnage in August than in the preceding month, although they report that shipments will continue to be well below requirements in most instances. Some district foundries report that their business backlogs are less heavy, but that they still are behind on current commitments. Importations of pig iron here are expected to be somewhat heavier this month than next, but the total will not provide any great relief, trade leaders declare.

Buffalo—Blowing in of the second Wickwire Spencer Steel Division blast furnace, which is scheduled for this week, will lift district pig iron operations to 100 per cent. The additional 400 tons daily, however, is likely to be spread thin with a certain percentage due to be earmarked for hard pressed New England consumers. Another encouraging factor is that the Tonawanda furnace will be operated for at least another two months, although the output has been pared. Foundries continue to operate on a curtailed basis due to tight pig iron market. Some melters are experimenting with a high percentage of scrap in an effort to stretch limited supplies of iron.

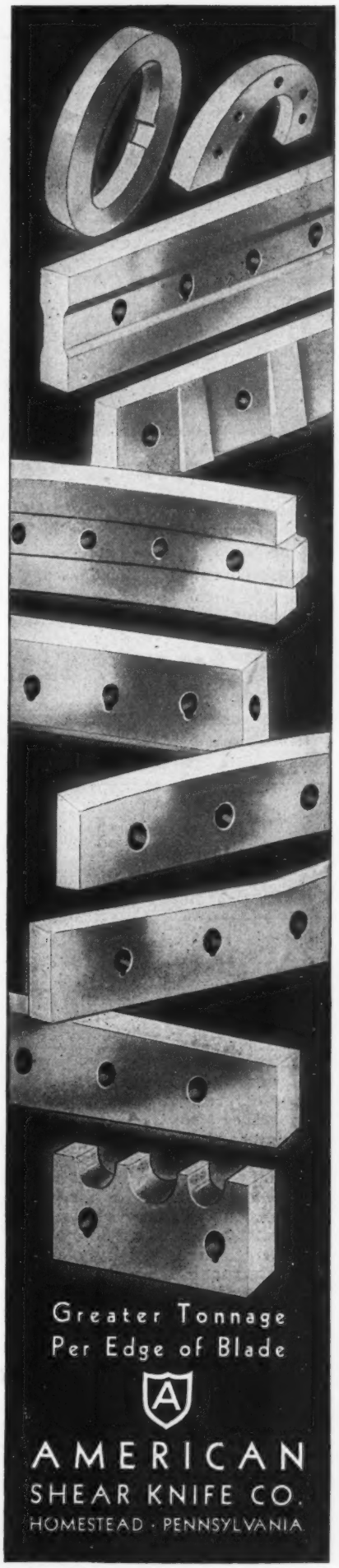
Pittsburgh—Producers of electric furnace silvery pig iron are quoting prices at point of production. Prices remain unchanged at higher levels established during June.

Cincinnati—Pig iron supply situation is unimproved, in both Northern and Southern tonnage. Melters are hoping that a possible step-up in deliveries the latter part of the month will fulfill allotment promises. Even so, the shortage of merchant iron will remain acute. Some of the jobbing foundries are shunning orders for large castings, to conserve iron stocks.

Cleveland—American Steel & Wire Co. has advanced the price on intermediate low phosphorus pig iron $2 per gross ton to the basis of $48 a ton, Central furnace, this city.

Chicago—With the taking off wind of on of Carnegie-Illinois' blast furnaces, four are now idle in the district. A Gary furnace was taken down for relining last week. Still out are two furnaces as the result of a recent plant explosion. Inland which has eight furnaces, has all eight on basic and expects to continue on that product for another 45 days before switching some of its units to merchant iron.

St. Louis—Missouri-Illinois Furnaces Inc., has blown out one of its two 500-ton furnaces for repairs expected to require 75 days. The remaining stack is alternating between basic and foundry iron, the output being prorated to customers. On resumption, capacity of that stack will have been raised to 550 tons daily. Mo-Ill furnishes most of the pig used in this district. Thus, the cutback is proving painful, though not disastrous. A few consumers managed to groundstock a little iron and some have arranged for supplies from Texas. The remaining deficit is largely being filled by increasing scrap in the melts, which in part accounts for an unusually severe scrap scarcity at the moment.



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A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

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McDanel Combustion Tubes are cast as one integral unit. Above illustration shows tube being removed from the mold.

McDanel Refractory Porcelain Co.
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Iron Ore . . .

Iron Ore Prices, Page 146

New York—Prices on spot lots of foreign iron ore from North Africa and Brazil are increasing sharply with some grades of basic now being quoted at around 18.50c to 19.00c per unit, CIF Atlantic ports. Meanwhile, Swedish basic, 60-68 per cent, continues unchanged at the slightly higher level of 14.50c.

Cleveland—Lake Superior Iron Ore shipments from upper lake ports increased in July to 11,821,019 tons from 11,727,367 tons in June, making the first six months' total 42,834,915 tons or an increase of 3,942,376 tons over the total for the like 1947 period, acording to the Lake Superior Iron Ore Association.

Scrap . . .

Scrap Prices, Page 150

Boston—Steel scrap prices are firm with a tendency toward return to normal differentials between grades; some melters are buying only No. 1 heavy melting scrap and paying $2 over No. 2, while turnings, bundles and busheling approximate quotations for the latter grade. Buying is steady and in most cases more scrap is moving from yards than is being gathered. Another scrap drive to ease the pig iron shortage is favored by New England governors who attended the quarterly conference in Vermont last week.

New York—Brokers have reduced their buying prices on charging box and heavy breakable cast to a range of $56 to $57 f.o.b. shipping point. Other cast grades are steady. Steel scrap continues in strong demand, except possibly bundles, on which a large Pittsburgh consumer has recently shut off shipments because of difficulty with some of the material received.

Buffalo—Sharply higher prices in cast scrap, which caught most of the trade by surprise, featured the scrap market last week. All signs of recent easement in cast disappeared when one of the principal consumers of this item placed an order for approximately 1500 tons at $64. The order calls for clean mixed cast. The price compares with recent sales within a range of $55 to $60 a ton. The sale also carried No. 1 cupola to $69 to $70.

Further activity in steelmaking grades was reported also at recently-hiked prices. Leading mills have standing orders as old contracts are completed. Material is now moving as rapidly at it is received. Two of the three Pennsylvania mills which were buying in midstate New York at premium prices have withdrawn from this area giving the Buffalo market a steadier tone.

Low phos, which lagged behind the recent price rise, joined in the upswing with corresponding boosts as sales were reported within a range of $46 to $47.

Philadelphia—Steel scrap prices continue steady, not withstanding the fact that tonnage is coming out more freely. Most consumers of open hearth grades have only modest inventories which they would like to build up further before leveling off on their demands. Following the recent reduction in heavy breakable

and charging box cast grades, the cast market has remained unchanged.

Pittsburgh — Scrap market was quiet last week pricewise. Mills have been able to make only a few small-lot commitments at the higher formula levels which were established a few weeks ago. Brokers are unwilling to gamble on large tonnage orders at this time. Ingot conversion deals continue to absorb a large portion of the limited amount of dealer scrap available, while a number of "behind-the-scenes" transactions, involving trading of scrap for steel are reported.

B. & O. railroad specialties brought $59.55 on its recent list. Bulk of railroad heavy melting continues to be allocated at formula prices, although consumers on off-line hauls must pay switching and other freight charges involved.

Cincinnati—Open-hearth grades of scrap are holding to the new formula price, although the flow of material has tapered. Some interests blame an invasion into source areas accompanied by higher offering bids for the slackening shipments. Foundry grades are unstable, but the general level of prices being paid by melters is not changing widely.

Chicago—Mills generally are satisfied with the current flow of scrap. It's large enough to maintain their operations, but that's about all that can be said for it. Foundries, too, are hampered more by the shortage of iron and coke than of scrap and are adding about as much scrap to the melt as they can. Pressure remains for increased supplies, however, to tide both kinds of melters over the winter months and the undertone of the market is strong, but not strong enough to cause a general increase in prices.

St. Louis—Scrap prices edged upward again last week in response to shorter shipments resulting from belief held by country dealers that prices will go still higher. Post-vacation resumption of full operations in some foundries and curtailment, for repairs, of local blast furnaces also have increased demand for scrap. Complaints of poor quality are increasing as this district appears to be scraping the bottom of its supply barrel.

Seattle—Cast iron scrap is reported in fair supply sufficient to enable plants to operate at normal levels. Buyers are generally holding the price level of $40 but occasional sales at $42 are reported. Steel scrap is arriving at the mills in increased volume and inventories are rising. The immediate outlook is favorable but the situation when surplus ships are no longer available is causing concern.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 146

Pittsburgh—Expenditure of $1 million has been approved by Pittsburgh Coke & Chemical Co. for construction of 15 new Koppers by-product coke ovens for production of oven foundry coke. This brings total of ovens at Neville Island plant to 85 and makes possible output of 50,000 additional tons annually. Jones & Laughlin recently pushed first coke from No. 1 battery of 106 coke ovens

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with Gerrard Steel Strapping

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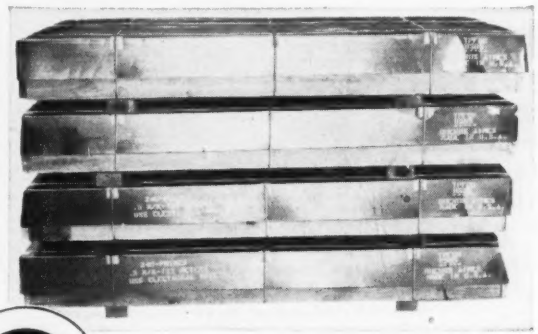

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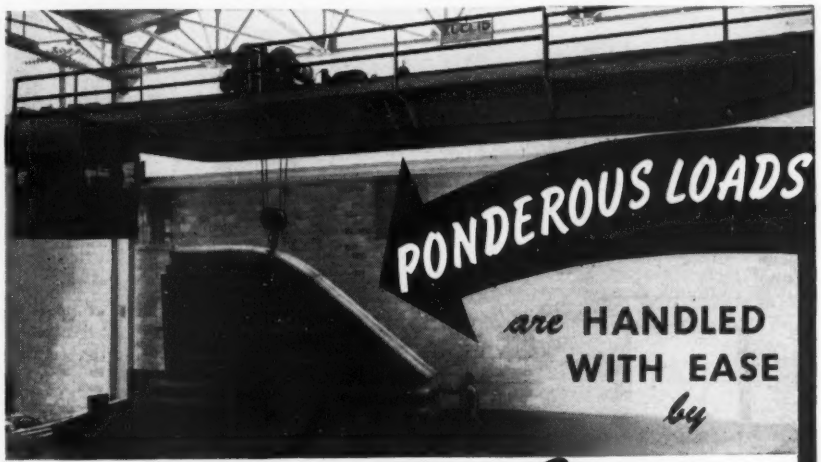

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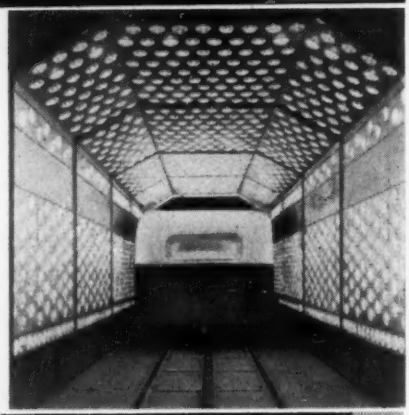

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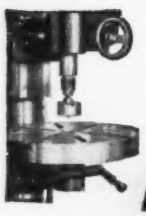

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at Aliquippa works. These ovens will replace original battery of 61 and will produce 53,350 tons per month, boosting plant's blast furnace coke capacity to 140,000 tons monthly.

Rails, Cars . . .

Track Material Prices, Page 145

New York—Domestic freight car demand is somewhat lighter and there are indications what this trend may continue for a while. Substantially higher cost of steel may have a depressing effect with the carriers likely to place greater emphasis on repairs rather than new construction.

Chicago—Plans are being prepared now by major Chicago railroads for their 1949 track and equipment programs, although as yet the size of their needs generally has not been revealed. Erie railroad has aproved purchase of 36,000 tons of rail for 1949, however, and the Nickel Plate will want 25,000 tons for its 1949 program.

Tin Plate . . .

Tin Plate Prices, Page 145

Birmingham—Tennessee Coal, Iron & Railroad Co. has announced a tin plate price of $6.90 a base box at Fairfield. The price reflects no change, the company said, from the former basing point price.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4000 tons, McNary dam, Oregon, to Willamette Iron & Steel Works, Gunderson Bros., Portland, Oreg. and Pacific Car & Foundry Co., Seattle.

900 tons, Hoosac pier, Boston, to American Bridge Co., Pittsburgh.

650 tons, power house at Sault Ste. Marie, Mich., for United States Engineers, Detroit, through Tuller Construction Co., Red Bank, N. J., to American Bridge Co., Pittsburgh.

450 tons, plant addition, Central Iron & Steel Co., Harrisburg, Pa., to Bethlehem Steel Co.

250 tons or more, cells and jail equipment Seattle Public Safety building, to Decatur Iron & Steel Co., Decatur, Ill., low $209,847, through Fentron Steel Works, Seattle.

210 tons, state bridge, Clinton county, Pennsylvania, to Bethlehem Steel Co.

200 tons, boiler house addition, American Viscose Co., Front Royal, Va., to Virginia Bridge Co., Roanoke, Va.

150 tons, plant addition, Harrisburg Steel Corp., Harrisburg, Pa., to Belmont Iron Works, Eddystone, Pa.

130 tons, plant addition, Lansdale Tube Co., Lansdale, Pa., to Bethlehem Steel Co.

100 tons plus, radial gates, Long Lake dam, Columbia Basin project, to Pacific Coast Engineering Co., Alameda, Cal., low $19,140.

STRUCTURAL STEEL PENDING

20,000 tons, United Nations Center, New York, plans expected out this week, with bids likely to be closed around the middle of next month; Harrison, Fouilhous & Abramovitz, 30 Rockefeller Plaza, that city, architects, with Edwards & Hjorth, 1267 Sixth Ave., Manhattan, and Madigan & Hyland, 28-34-41st Ave., Long Island City, consulting steel engineers; proposed work will involve two major buildings—assembly and secretarial buildings.

3500 tons, addition, Naval Veterans Hospital, St. Albans, N. Y., bids to be opened in Washington, Sept. 1.

400 tons, new buildings Tacoma smelter; awards pending.

350 tons, (including 85 tons reinforcing) bridge near Salem, Oreg.; bids to Public Roads Administration, Portland, Oreg., Aug. 18.

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- Prices are F.O.B. Los Angeles.
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Electric Cranes ● Hand Cranes ● Jib Cranes ● Sheaves ● Sheave Blocks
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SAFETY PLATE GRIPS

A non-slip grip to handle steel sheets, plate, pipe, structural shapes and open top barrels or drums in vertical or horizontal position.

Item	Cap. Tons	Handles Plates	Weight	Price
382	½	0" to ⅜"	13 lbs.	$18.00
383	2½	0" to ¾"	40 lbs.	$26.00
393	3	0" to 1 "	50 lbs.	$36.00
384	4½	0" to 1½"	84 lbs.	$39.00
385	8	0" to 2 "	153 lbs.	$73.00

SCREW PLATE CLAMPS

A reliable clamp with hardened set screw for erecting structural steel, tanks, etc. Also for lifting and positioning steel plates at bending rolls, brakes, shears and similar processing operations.

Item No.	Cap. Pounds	For Plates Up to	Weight	Price
411	5000	1 "	25 lbs.	$22.00
412	5000	1½"	27 lbs.	$25.00
413	5000	2 "	29 lbs.	$29.00

DOWNS BEAM TONGS

Here's standard equipment for plants handling or processing steel beams and girders: A fast, safe means of moving flanged sections in vertical or upright position.

Item	Cap. Pounds	Max. Beam Flange Widths	Weight	Price
420	1½	5"	10 lbs.	$16.00
421	3	8"	40 lbs.	$40.00

PIPE TONGS

Tongs for handling heavy pipe, bundled bar stock, billets, bars, castings and steel turnings. Pick up a bundle or a single bar from a pile—or lift bar stock directly off floor without blocking under.

Item	Cap. Tons	Size Pipe or Round Stock	Weight Each	Price
365	¾	1" to 3½" O.D.	26 lbs.	$24.00
366	1½	2" to 7 " O.D.	58 lbs.	$36.00
369	3	5" to 13 " O.D.	150 lbs.	$98.00

PLATE & BEAM HOOKS

Handle plates, beams, or other structural material in horizontal or flat position with these Hooks. Tapered opening causes hooks to wedge tightly on edge of material for a non-slip grip. Slot in lower lip permits hook to straddle web of beam for lifting sections from ends.

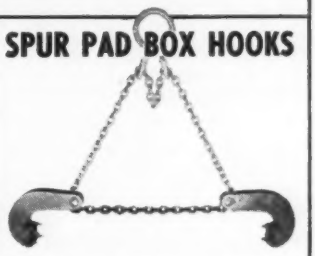
Item	Cap. Pounds	For Plates Up to	Weight	Price
464	1500	1 "	7 lbs.	$ 6.00
465	3000	1¾"	21 lbs.	$11.00

DRUM CHIME TONGS

Handles steel drums 18" to 24" diameter in upright or vertical position. No adjustments to make—simply slide jaws in or out to drop over rim of drum and lift. Self-equalizing grip.

Item	Cap.	Jaw Opening For Drums	Jaw Opening For Chime	Price
245	750	18" to 24" dia.	⅜"	$28.00

SPUR PAD BOX HOOKS



Here's a grab to handle boxes and crates of all descriptions. Ease your handling problem with Downs Spur Pad Box Hooks and Slings.

Item	Capacity	Reach of Pad Hooks	Weight	Price
450	1000	5 feet	26 lbs.	$33.00
452	2000	5 feet	40 lbs.	$42.00

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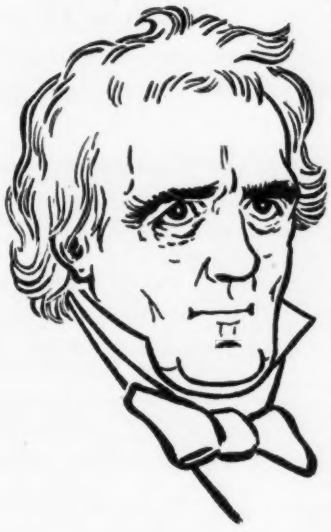

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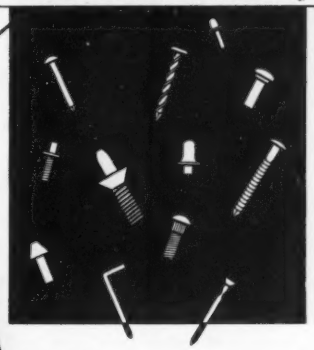
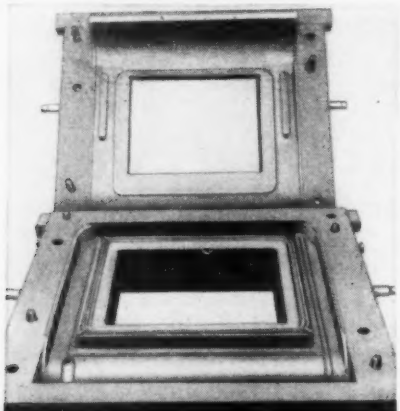


HASSALL cold-heading may solve your immediate special part problem . . . Special nails, rivets and threaded parts made in diameters from 1/32" to 3/8"—lengths up to 7"... Rivets 3/32" diameter and smaller a specialty . . .Variety of metals, finishes and secondary operations . . . Economy, quality and quick delivery in large or small quantities . . .Tell us what you need . . . We will answer promptly. ASK FOR FREE CATALOG. 3-color Decimal Equivalents Wall Chart free on request.

JOHN HASSALL, INC. Oakland & Clay Sts. Brooklyn 22, N.Y.

Manufacturers of Cold-Headed Specialties—Established 1850



40% Saving in Machine Time

with

SPEED CASE® PLATE

Produced by Luzerne Rubber Company of Trenton, New Jersey, both male and female sections of this 28"x30" hard rubber, refrigerator door mold were machined from 5" thick Speed Case Plate. The superior machining qualities of Speed Case enabled the manufacturer to effect a saving of 40% over commercial quality hot rolled plate. In this application although a large amount of metal was removed, distortion was negligible.

W. J. HOLLIDAY & CO., INC.

Speed Case - Speed Treat Plate Division

HAMMOND INDIANA

Plants at Hammond and Indianapolis

SPEED CASE — SPEED TREAT WAREHOUSE DISTRIBUTORS

AKRON 1, Ohio
The Burger Iron Company
BOSTON 10, Massachusetts
Brown-Wales Company
BUFFALO 5, New York
Beals, McCarthy and Rogers, Inc.
DETROIT 7, Michigan
Peninsular Steel Co.
HOUSTON 1, Texas
Earle M. Jorgensen Co.
LOS ANGELES 54, California
Earle M. Jorgensen Co.
MEMPHIS 2, Tennessee
Pidgeon-Thomas Iron Company
NEWARK 5, New Jersey
Grammer, Dempsey & Hudson, Inc.
OAKLAND 7, California
Earle M. Jorgensen Co.
PHILADELPHIA 34, Pennsylvania
Horace T. Potts Co.

CANADA:
Toronto 2, Ontario, Peckover's, Ltd.

SPEED CASE®
Low Carbon
SPEED TREAT®
Medium Carbon
Open Hearth • Free Machining
STEEL PLATES

W. J. HOLLIDAY & CO. 92 1850 YEARS of STEEL 1942

275 tons, powerhouse, Stanolin Corp., Kansas; Stone & Webster Engineering Corp., Boston, contractor-engineer.

125 tons, switchyard, transformer circuits, etc.; bids to Bureau of Reclamation, Denver, Aug. 19.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3000 tons, McNary dam and powerhouse, to Gilmore Steel & Supply Co., Oakland, Calif., and others, by McNary Dam Contractors.

1500 tons, Public Safety building, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Kuney & Johnson, Seattle, general contract.

100 tons, Washington state road bridge, Skagit county, to Northwest Steel Rolling Mills, Inc., Seattle; C. V. Wilder, Bellingham, Wash., general contract.

REINFORCING BARS PENDING

5000 to 7000 tons, depending on design adopted, 12,900-foot Soap Lake 22.3-inch diameter siphon, Columbia Basin project; bids to Bureau of Reclamation, Denver, Aug. 13.

100 tons, Washington state Nooksack river bridge, Clark Eldridge, Tacoma, low, $179,277.

100 tons, 130-foot box girder span; bids to Lewis county commissioners, Chehalis, Wash., Aug. 19.

Unstated, 8-story concrete Veterans Administration hospital, $5 million project; bids to U. S. Engineer, Seattle, Sept. 7.

Unstated, University of Washington music building, Seattle; Strand & Sons, Seattle, low $1,099,236.

Unstated, 4-story $1 million state office building; bids to Board of Examiners, Helena, Mont., Sept. 3.

Unstated, $400,000 state library, Bozeman, Mont.; bids to Helena, Sept. 1.

Unstated, addition to Deaconess hospital, Billings, Mont.; general contract to Cahill-Mooney Construction Co., Billings, low $576,166.

PLATES . . .

PLATES PLACED

100 tons, miscellaneous small contracts, to Puget Sound Sheet Metal Works, Seattle.

PLATES PENDING

2700 tons, liner plates for Soap Lake siphon, Columbia Basin; bids to Bureau of Reclamation, Denver, Aug. 13.

PIPE . . .

STEEL PIPE PENDING

Unstated, 7800 feet 12 or 14-inch steel pipe, or alternatives; bids to Astoria, Oreg., Aug. 16.

Unstated, 36,000 feet 4 to 8-inch steel mains for McNary dam; bids to U. S. Engineer Portland, Oreg., Aug. 27; government to furnish materials.

CAST IRON PIPE PLACED

990 tons, 12 and 16-inch cast iron pipe, Haverhill, Mass., to R.D. Wood Co., Florence, N. J.

CAST IRON PIPE PENDING

530 tons, 6, 8 and 12-inch cast iron pipe, Byfield, Mass.; project abandoned.

500 tons, 8 to 20-inch cast iron pipe, or alternatives, sewage treatment system; bids to Bremerton, Wash., in September.

190 tons, 6, 8 and 12-inch cast iron pipe, Pembroke, Mass.; bids in

100 tons, 4 to 12-inch; bids in at Raymond, Wash.

RAILS, CARS . . .

RAILROAD CARS PLACED

Missouri Pacific, 1000 seventy-ton gondolas, to its DeSoto, Mo., shop.

RAILROAD CARS PENDING

Reading, 1000 seventy-ton hopper cars.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

PINE BLUFF, ARK.—Arkansas Power & Light Co. is planning to build a $15,000,000 electric power plant in eastern Arkansas and a $9,000,000 steam generating plant at Lake Catherine.

CALIFORNIA

NILES, CALIF.—Pacific States Steel Corp. plans to complete its $2,500,000 construction program during August. The company has also acquired 15 acres adjoining its 50-acre site.

SAN CARLOS, CALIF.—Kuster Laboratories, 57 Seventeenth St., San Francisco, has awarded a $130,000 contract to Remmet Construction Co., Box 878, Palo Alto, for erection of a manufacturing plant and laboratory.

VERNON, CALIF.—Central Mfg. Distributors Inc., 4814 Loma Vista Ave., Los Angeles, has awarded a $650,000 contract to William P. Neil Co. Ltd., 4814 Loma Vista Ave., Los Angeles, for two warehouses for Western Electric Supply Co. and Western Electric Corp.

ILLINOIS

CASEYVILLE, ILL.—The village has awarded a $99,300 general contract to John Hall, Decatur, for the installation of about 28,000 ft of 2, 4 and 6-inch water mains; J. E. Weinel, East St. Louis, consulting engineer.

JOLIET, ILL.—The Public Service Co. of Northern Illinois has awarded a $350,000 contract to the Robert Regan Co. for an office and garage building.

LEMONT, ILL.—University of Chicago has awarded a contract to the Austin Co. for construction of the permanent buildings on the site of the Argonne National Laboratory for Atomic Energy Research near here. The university is prime contractor for the Atomic Energy Commission on the project. More than $30 million will be spent in a three-year building program.

MARYLAND

BALTIMORE, MD.—Cambridge Iron & Metal Works is planning to erect a building at 2030 Aliceanna St.

BALTIMORE, MD.—American Radiator & Standard Sanitary Corp. has completed plans for addition to warehouse and cleaning building at 5003-5315 Holabird Ave., Highlandtown, costing approximately $486,000; Prack & Prack, Pittsburgh, Pa., architect.

OHIO

AKRON—Coventry Metal Castings Inc. has been formed by R. B. Piazza, E. M. Starr and Robert S. Pflueger, 329 Second National Bldg.

BUCYRUS, O—Timken Roller Bearing Co.'s new Bucyrus bearing plant, L. M. Klinedinst, vice president, will soon be ready for full production. In time, this plant will become one of the company's principal plants in which complete bearing units will be manufactured for all purposes in industry.

CLEVELAND—Lempco International Inc., subsidiary of Lempco Products Co., 5490 Dunham Rd., has just received orders from Holland and Norway for spare parts of trucks including timing chains, gears and axles.

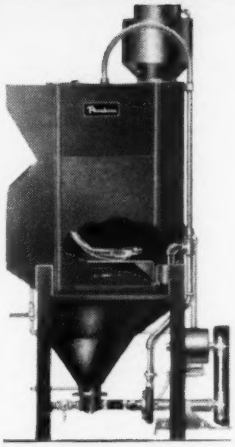
CLEVELAND—Aluminum Match Plate Co., formerly Western Aluminum Match Plate Co., 1638 Fall St., has been incorporated by Fred J. Cibula, owner, to produce aluminum pattern castings, match plates and brass and white metal patterns and castings.

PENNSYLVANIA

NEWCASTLE, PA.—Elco Steel Co., North

New PANGBORN "HYDRO-FINISH"

Holds Tolerances to .0001 Inch While:
1. Improving surface finish 2. Removing oxide scale 3. Increasing tool and die life



Pangborn "HYDRO-FINISH" is the remarkable new form of impact blasting using fine abrasive suspended in a liquid. This new "HYDRO-FINISH" process has unlimited applications.

In the Tool Room — for tool, die and mold manufacture and maintenance. This streamlined operation eliminates hours of hand work and produces a surface virtually free of directional lines.

In the Production Line — to eliminate many tedious operations, reduce buffing costs, improve fatigue life, cut manufacturing cost.

WRITE TODAY for complete information about the "HYDRO-FINISH" Cabinet that produces this new finish with maximum efficiency and economy. Come to Pangborn Corporation, 1202 Pangborn Boulevard, Hagerstown, Maryland.

Pangborn
BLAST CLEANS CHEAPER
with the right equipment for every job

NAH MACHINE CO.

WIRE AND METAL FORMING MACHINES
For Forming Wire and Punching Patterns
Special Machines Designed and Built to Order

THE A.H. NILSON MACHINE CO. Bridgeport 5, Conn.

PERFORATED METALS
TO YOUR REQUIREMENTS
FOR
ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
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BOX 32 WYOMING, PA.

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in High Ambient Temperatures

This Welco Motor is designed to operate in continuous horse-power applications near the "motor killing" temperatures of baking ovens, boilers, and other sources of intense heat.

These special construction features assure a motor temperature rise no greater than 25° C.

- ★ **Big Rugged Turbine Type Fan**
- ★ **Extra Laminations of Finest Sheet Steel**
- ★ **Heavy Gage Wire**
- ★ **"Life-time" Sealed Bearings**

These open protected type ball bearing motors have unusually high efficiency and power factor. Available in all sizes to fit NEMA Frames between 203 and 365.

Write for full information.

THE B. A. WESCHE ELECTRIC CO.
1624-35 Vine Street Cincinnati, Ohio.

Cedar St., is building a large addition which will double its space. The company is planning to install annealing furnaces and more machinery which will include the setting up of a 36-inch mill for rolling sheets.

PHILADELPHIA—Brown Instrument Co., Wayne and Roberts Ave., will build a plant and office costing $68,000.

PHILADELPHIA—Delta Finishing Co., Lewis and Ashland Sts., has awarded a $70,000 contract to L. E. Bender, 1137 Wakeling St., for a dye plant addition.

PHILADELPHIA—Western Electric Co. Inc., 300 E. Allegheny Ave., has awarded a $100,000 contract to Barclay White Co., 22 N. 36 St., for a plant addition.

WEST CONSHOHOCKEN, PA.—Philadephia Electric Co. has awarded a $250,000 contract to Haverstick Borthwick Co., 1505 Race St., Philadelphia, for construction of a gas plant, boiler house switch room, locker room and office pump house; United Engineers & Constructors Inc., 1401 Arch St., Philadelphia, engineer.

RHODE ISLAND

NORTH PROVIDENCE, R. I.—D. & S. Screw Products Co., 2074 Smith St., plans to build a $68,000 factory on Waterman Ave.; A. J. Sampson, 28 Wellesley Ave., architect.

PAWTUCKET, R. I.—Pawtucket Times Publishing Co., Times Bldg., is planning to spend $125,000 for alterations to its publishing plant; Dwight Seabury Co., 188 Main St., architect.

PROVIDENCE, R. I.—Monowatt Electric Co., 66 Bissell St., has awarded a $70,000 contract to Rowley Construction Co., 260 Central Ave., Pawtucket, for erection of a factory with machine shop and molding departments; Cull & Robinson, 811 Industrial Trust Bldg., architects.

SOUTH CAROLINA

GREENWOOD, S. C.—Greenwood Cotton Mills, is contemplating constructing a $3 million rayon weaving plant; McPherson Co., architect.

TENNESSEE

ATHENS, TENN.—Athens Stove Co. is planning a $169,000 factory addition.

TEXAS

BIG SPRING, TEX.—Cosden Petroleum Corp. is planning to build a $1,500,000 catalytic cracking unit.

DALLAS, TEXAS—Master Tank & Welding Co., 1612 Singleton Blvd. will spend $80,000 for plant expansion.

DALLAS, TEX.—Lone Star Gas Co., 1915 Wood St., is planning to build two compressor stations, one in Howe costing $325,000 and the other in Munday costing $200,000.

ETTER, TEX.—Phillips Chemical Co., Bartlesville, Okla. is planning to build a $2,500,000 ammonian nitrate plant.

GRAND PRAIRIE, TEX.—Chance Vought Aircraft Corp. has awarded a $550,000 contract to James Stewart & Co. Inc., Magnolia Bldg., Dallas, for a shop; Albert Kahn, 345 New Center Bldg., Detroit, Mich., architect.

HOUSTON, TEX.—Hercules Powder Co., 908 Market St., Wilmington, Del., is planning to remodel its chemical plant on Ship Channel at a cost of $250,000.

HOUSTON, TEX—N. J. Klein, 603 Avondale St., plans by J. B. Dannenbaum, 3[illegible] Main St., will build two warehouses at Harvey Wilson Drive and Turkey St. costing $225,000.

HOUSTON, TEX.—Houston Asbestos Co., c/o Frank W. Sharp, 1526 Welch St., will double the size of their asbestos plant at a cost of $250,000.

HOUSTON, TEX.—Phillips Chemical Co., Bartlesville, Okla., is contemplating building a $6 million ammonium sulphate plant on Ship Channel.

KELSEY, TEX.—Humble Oil & Refining Co., 1216 Main St., Houston, is considering building gas injection plant units costing $1,640,000.

WASHINGTON

SEATTLE—Associated Lead & Zinc Co. has awarded a general contract to Howard S. Wright Co. for the first unit of a proposed plant at 2800 First Ave. S.W.

SPOKANE, WASH.—Pacific Telephone and Telegraph Co., Telephone Bldg., will build a $130,000 construction and engineering building; H. C. Bertelson, Empire State Bldg., architect.

CANADA

VANCOUVER, B. C.,—British Columbia Ice & Cold Storage Ltd., 2115 Commissioner St., has awarded a $2 million contract to Northern Construction Co. and J. W. Stewart Ltd. for a plant addition.

VANCOUVER, B. C.—Aluminum Co. of Canada Ltd., Sun Life Bldg., Montreal, Que., is planning to build an aluminum plant, and a hydroelectric plant costing $900,000.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page 147*)

c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3¼ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si), Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.